Connecting via Winsock to STN

(1)

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LOGINID:ssspta1621con

PASSWORD:
TERMINAL (ENTER 1, 2, 3, OR ?):2

* * * * * * * * * * Welcome to STN International * * * * * * * * * *

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NEWS 4	NOV 15	Derwent Indian patent publication number format enhanced
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AND CURRENT DISCOVER FILE IS DATED 20 FEBRUARY 2008

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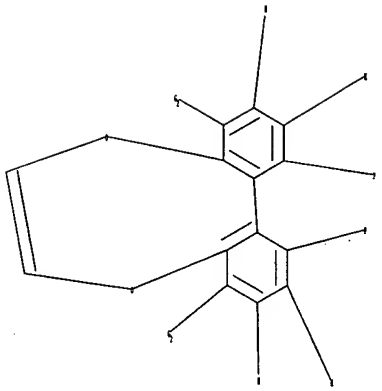

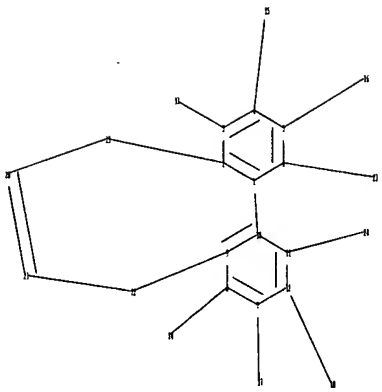

chain nodes :
13 14 15 16 17 18 23 24
ring nodes :
1 2 3 4 5 6 7 8 9 10 11 12 19 20 21 22
chain bonds :
3-13 4-15 5-16 6-23 7-17 8-14 11-24 12-18
ring bonds :
1-2 1-6 1-10 2-3 2-19 3-4 4-5 5-6 7-8 7-12 8-9 9-10 9-22 10-11 11-12
19-20 20-21 21-22
exact/norm bonds :
1-10 2-19 3-13 8-14 9-22 19-20 20-21 21-22
exact bonds :
4-15 5-16 6-23 7-17 11-24 12-18
normalized bonds :
1-2 1-6 2-3 3-4 4-5 5-6 7-8 7-12 8-9 9-10 10-11 11-12

G1:Cl,Br,F,I

G2:H,Cl,Br,F,I

Match level :
1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:Atom 8:Atom 9:Atom 10:Atom
11:Atom 12:Atom 13:CLASS 14:CLASS 15:CLASS 16:CLASS 17:CLASS 18:CLASS
19:Atom 20:Atom 21:Atom 22:Atom 23:CLASS 24:CLASS

L1 STRUCTURE UPLOADED

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=> S L1 FULL
FULL SEARCH INITIATED 18:10:17 FILE 'REGISTRY'
FULL SCREEN SEARCH COMPLETED -      2139 TO ITERATE

100.0% PROCESSED     2139 ITERATIONS                                 1 ANSWERS
SEARCH TIME: 00.00.01

L2             1 SEA SSS FUL L1

=> FILE CAPLUS
COST IN U.S. DOLLARS                                SINCE FILE      TOTAL
                                                       ENTRY    SESSION
FULL ESTIMATED COST                                   178.36     178.57

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=> S L2
L3             1 L2

=> D L3 IBIB ABS HITSTR 1

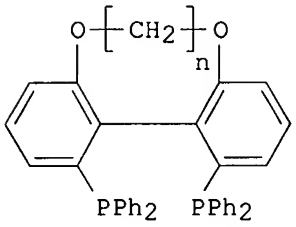
L3   ANSWER 1 OF 1  CAPLUS  COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER:         2001:228894  CAPLUS
DOCUMENT NUMBER:          134:266437
TITLE:                    Chiral phosphines, transition metal complexes thereof
                          and uses thereof in asymmetric reactions
INVENTOR(S):              Zhang, Xumu
PATENT ASSIGNEE(S):       Penn State Research Foundation, USA
SOURCE:                   PCT Int. Appl., 52 pp.
                          CODEN: PIXXD2
DOCUMENT TYPE:            Patent
LANGUAGE:                 English
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

     PATENT NO.           KIND   DATE        APPLICATION NO.          DATE
     ---------------      ----   --------    --------------------     --------
     WO 2001021625         A1    20010329    WO 2000-US25635          20000919
         W:  AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,
             CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR,
             HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT,
             LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU,
```

SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

CA 2385421	A1	20010329	CA 2000-2385421		20000919
EP 1214328	A1	20020619	EP 2000-965136		20000919
EP 1214328	B1	20060503			
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL					
US 6521769	B1	20030218	US 2000-665456		20000919
JP 2003509513	T	20030311	JP 2001-525000		20000919
AT 324943	T	20060615	AT 2000-965136		20000919
ES 2263487	T3	20061216	ES 2000-965136		20000919
PRIORITY APPLN. INFO.:			US 1999-154845P	P	19990920
			WO 2000-US25635	W	20000919

OTHER SOURCE(S): CASREACT 134:266437; MARPAT 134:266437
GI



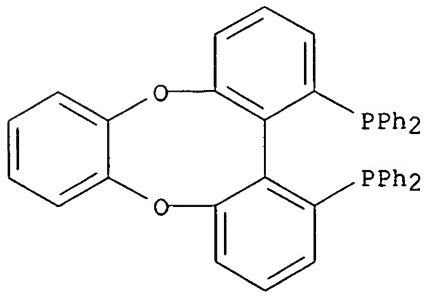
I

AB Chiral ligands and transition metal complexes based on such chiral ligands useful in asym. catalysis are disclosed. The chiral ligands include chiral C1-C6-TunaPhos ligands I (n = 1-6). The ruthenium TunaPhos complex reduces ketones to the corresponding alcs. with 95-99.6 % enantioselectivity. The transition metal complexes of the chiral ligands are useful in asym. reactions such as asym. hydrogenation, hydride transfer, hydrosilylation, hydroboration, hydrovinylation, hydroformylation, hydrocarboxylation, isomerization, allylic alkylation, cyclopropanation, Diels-Alder reaction, Heck reaction, isomerization, Aldol reaction, Michael addition and epoxidn. reactions.

IT 331768-60-6
RL: CAT (Catalyst use); USES (Uses)
(preparation of chiral diphosphines as cocatalyst in transition metal complex catalyzed asym. reactions)

RN 331768-60-6 CAPLUS

CN Phosphine, (14aR)-tribenzo[b,e,g][1,4]dioxocin-1,14-diylbis[diphenyl- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

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FULL ESTIMATED COST	5.93	184.50

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)	SINCE FILE ENTRY	TOTAL SESSION
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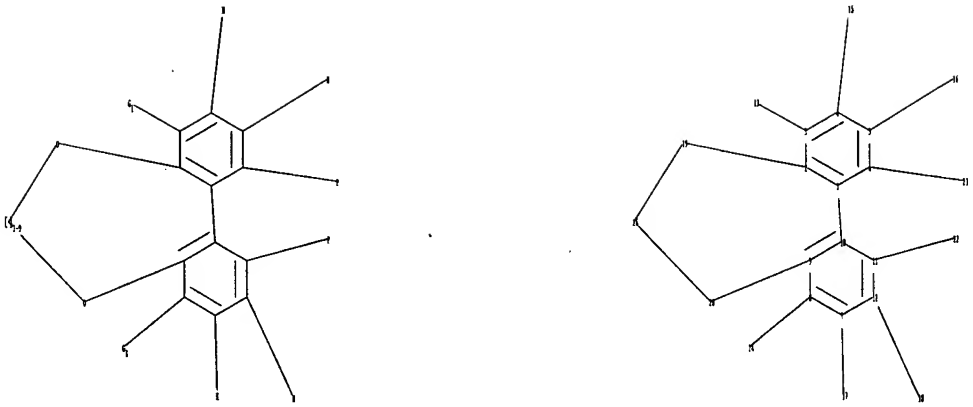
Uploading C:\Program Files\Stnexp\Queries\APP-6.str



chain nodes :
13 14 15 16 17 18 21 22
ring nodes :
1 2 3 4 5 6 7 8 9 10 11 12 19 20 26
chain bonds :
3-13 4-15 5-16 6-21 7-17 8-14 11-22 12-18
ring bonds :
1-2 1-6 1-10 2-3 2-19 3-4 4-5 5-6 7-8 7-12 8-9 9-10 9-20 10-11 11-12
19-26 20-26
exact/norm bonds :
1-2 1-6 1-10 2-3 2-19 3-13 8-14 9-10 9-20 10-11 19-26 20-26
exact bonds :
4-15 5-16 6-21 7-17 11-22 12-18
normalized bonds :
3-4 4-5 5-6 7-8 7-12 8-9 11-12

G1:Cl,Br,F,I

G2:H,Cl,Br,F,I

Match level :
1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:Atom 8:Atom 9:Atom 10:Atom
11:Atom 12:Atom 13:CLASS 14:CLASS 15:CLASS 16:CLASS 17:CLASS 18:CLASS
19:Atom 20:Atom 21:CLASS 22:CLASS 26:CLASS

```
L1      STRUCTURE UPLOADED

=> S L1 FULL
FULL SEARCH INITIATED 18:19:54 FILE 'REGISTRY'
FULL SCREEN SEARCH COMPLETED -        9 TO ITERATE

100.0% PROCESSED        9 ITERATIONS                                 0 ANSWERS
SEARCH TIME: 00.00.01

L2            0 SEA SSS FUL L1

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COST IN U.S. DOLLARS                                  SINCE FILE      TOTAL
                                                         ENTRY    SESSION
FULL ESTIMATED COST                                     178.36     178.57

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L3            0 L2

=>

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=> LOG Y

COST IN U.S. DOLLARS                                  SINCE FILE      TOTAL
                                                         ENTRY    SESSION
FULL ESTIMATED COST                                       0.48     179.05

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```

3

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PASSWORD:
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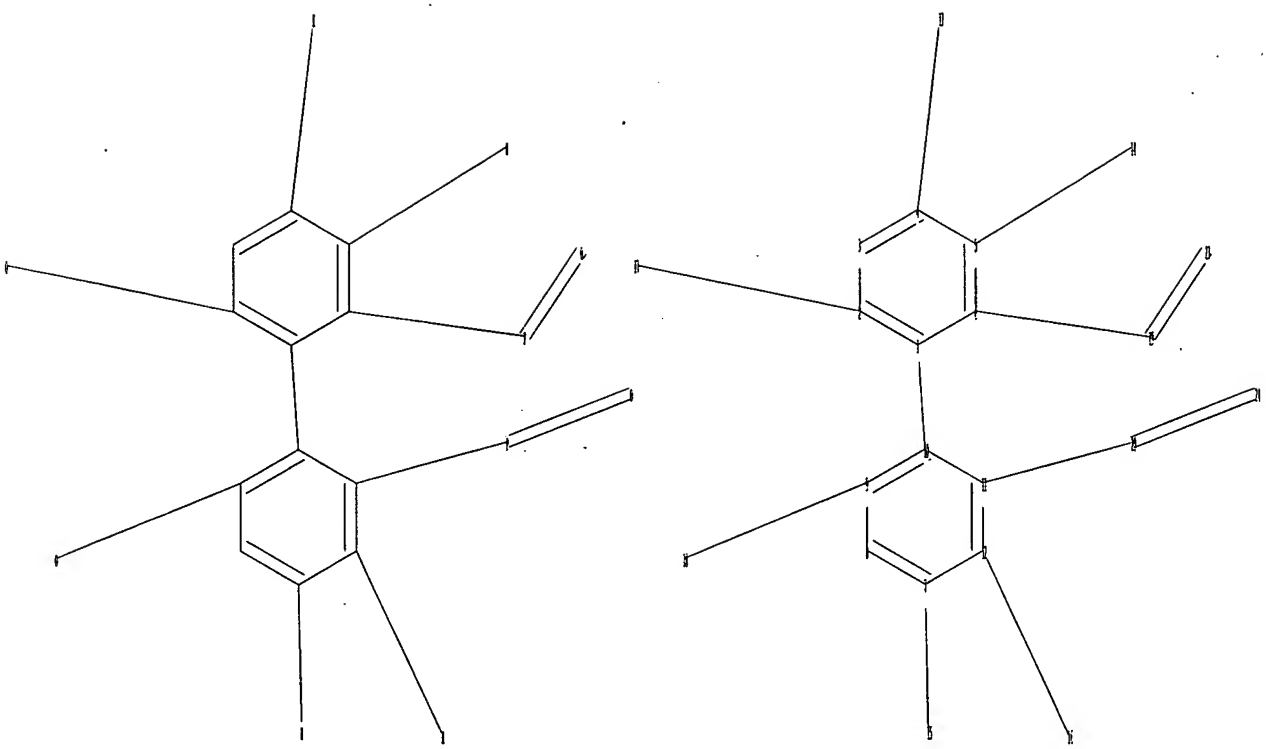

chain nodes :
13 14 15 16 17 18 19 20 23 24
ring nodes :
1 2 3 4 5 6 7 8 9 10 11 12
chain bonds :
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ring bonds :
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G2:H,Cl,Br,F,I

Match level :
1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:Atom 8:Atom 9:Atom 10:Atom
11:Atom 12:Atom 13:CLASS 14:CLASS 15:CLASS 16:CLASS 17:Atom 18:Atom
19:CLASS 20:CLASS 23:CLASS 24:CLASS

L1 STRUCTURE UPLOADED

=> D L1
L1 HAS NO ANSWERS
L1 STR

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Structure attributes must be viewed using STN Express query preparation.

=> S L1 FULL
FULL SEARCH INITIATED 08:42:03 FILE 'REGISTRY'
FULL SCREEN SEARCH COMPLETED - 737 TO ITERATE

100.0% PROCESSED 737 ITERATIONS 127 ANSWERS
SEARCH TIME: 00.00.01

L2 127 SEA SSS FUL L1

=> FILE CAPLUS

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	178.82	179.66

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=> S L2
L3 31 L2

=> D L3 IBIB ABS HITSTR 1-31

L3 ANSWER 1 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2007:1053337 CAPLUS
DOCUMENT NUMBER: 147:365607
TITLE: Process for recovery of phosphorus-containing ligands from metal compounds with phosphine ligands used as homogeneous catalysts by sequential oxidation, extraction and isolation steps
INVENTOR(S): Schlummer, Bjoern; Scholz, Ulrich; Risch, Nikolaus.; Majoros, Laszlo
PATENT ASSIGNEE(S): Saltigo GmbH, Germany; Universitaet Paderborn
SOURCE: Eur. Pat. Appl., 14pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

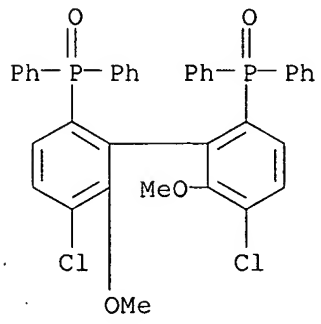
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

EP 1834695 A1 20070919 EP 2007-4910 20070309
R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LI, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR, AL, BA, HR, MK, YU
DE 102006011867 A1 20070920 DE 2006-102006011867 20060315
US 20080021245 A1 20080124 US 2007-716914 20070312
PRIORITY APPLN. INFO.: DE 2006-102006011867A 20060315
OTHER SOURCE(S): CASREACT 147:365607; MARPAT 147:365607

AB Phosphine ligands R1PR2R3 [R1, R2, R3 = (un)substituted C1-8 alkyl, aryl, aralkyl; substituents, e.g., Cl, Br, iodo, F; C1-8 alkyl, aryl or aralkyl; NO2, alkoxy, aryloxy] are recovered from reaction mixts. upon completion of the reaction in which transition metal complexes with phosphine ligands, preferably Ru, Pd, Re or Pt complexes, are used as homogeneous catalysts by sequentially contacting the residual reaction mixture with an oxidizing agent, preferably H2O2, NaClO, O2, halogen oxide derivs., S8 or Se, extraction of the reaction mixture with an organic solvent immiscible with the mixture, preferably a halogenated hydrocarbon such as CH2Cl2, an ether such as Bu2O, an alc., or an aromatic compound such as PhMe, to sep. out the transition-metal oxide thus produced, and isolation of the oxidized phosphine from the organic solvent separated from the reaction mixture, e.g., by recrystn.; the oxidized phosphine thus obtained can be treated with a reductant such as H2 or a halosilane to give the original phosphine. E.g., after 0.08 mmol (1%) [RuBr2(L)] [L = 5,5'-dichloro-6,6'-dimethoxy-2,2'-bis(diphenylphosphino)-1,1'-biphenyl] was used as the homogeneous catalyst in hydrogenation of Et acetoacetate, the residue from distillation of product was treated with 1 mL 35% aqueous H2O2, stirred 1 h, then treated with 25 mL more water and extracted wtih 3 mL Bu2O and heated 2 h at 140°; subsequent removal of Ru oxide by filtration and removal of solvent afforded 56% of the bis-oxide of L.

IT 185836-54-8P
RL: SPN (Synthetic preparation); PREP (Preparation)
(process for recovery of P-containing ligands from metal compds. with phosphine ligands used as homogeneous catalysts by sequential oxidation, extraction and isolation steps)

RN 185836-54-8 CAPLUS
CN Phosphine oxide, [3',5-dichloro-6'-(diphenylphosphinyl)-2',6-dimethoxy[1,1'-biphenyl]-2-yl]diphenyl- (CA INDEX NAME)



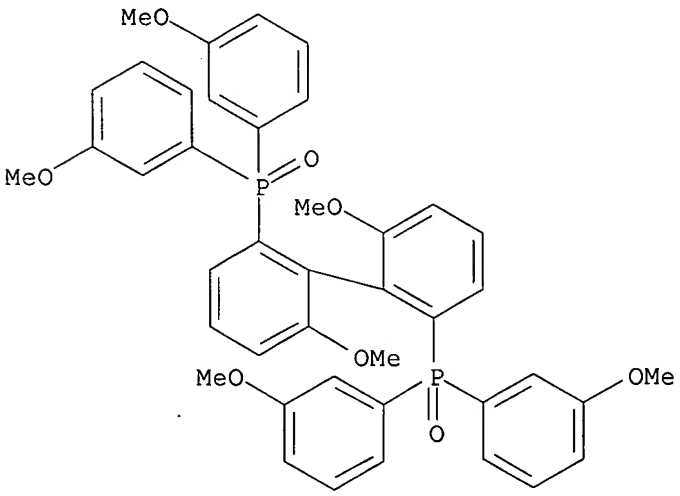
REFERENCE COUNT: 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 2 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2007:72653 CAPLUS
DOCUMENT NUMBER: 146:337264
TITLE: Iron Porphyrin-Catalyzed Olefination of Ketenes with Diazoacetate for the Enantioselective Synthesis of Allenes
AUTHOR(S): Li, Chuan-Ying; Wang, Xiao-Bing; Sun, Xiu-Li; Tang, Yong; Zheng, Jun-Cheng; Xu, Zheng-Hu; Zhou, Yong-Gui;

Dai, Li-Xin
CORPORATE SOURCE: State Key Laboratory of Organometallic Chemistry, Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences, Shanghai, 200032, Peop. Rep. China
SOURCE: Journal of the American Chemical Society (2007), 129(6), 1494-1495
CODEN: JACSAT; ISSN: 0002-7863
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 146:337264
AB In the presence of Ph3P and catalytic Fe(TCP)Cl, ketenes R1R2C:C:O (R1 = Br, EtO2C, n-Bu, Ph, 4-ClC6H4, etc.; R2 = H, Me, Et, Me2CH, allyl, etc.) could react with Et diazoacetate to give allenes R1R2C:C:CHCO2Et in high yields under neutral conditions. By employing a chiral phosphine instead of PPh3, allenes could be synthesized with high enantioselectivity (93-98% ee) in good yields.

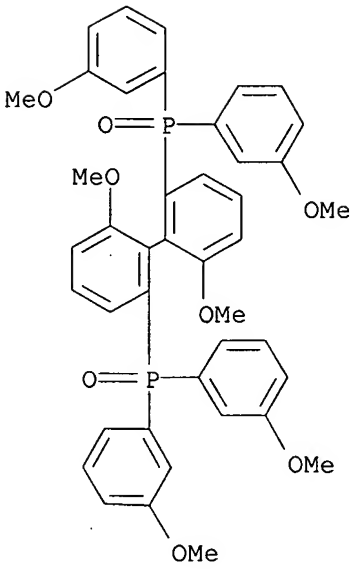
IT 929007-26-1P
RL: PUR (Purification or recovery); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(asym. synthesis of ethoxycarbonyl-substituted allenes via iron porphyrin-catalyzed olefination of ketenes with diazoacetate)

RN 929007-26-1 CAPLUS
CN Phosphine oxide, 1,1'-[(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-bis(3-methoxyphenyl)- (CA INDEX NAME)



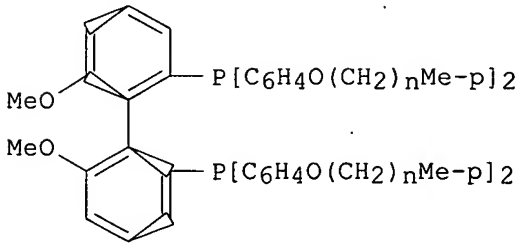
IT 928835-63-6P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(asym. synthesis of ethoxycarbonyl-substituted allenes via iron porphyrin-catalyzed olefination of ketenes with diazoacetate)

RN 928835-63-6 CAPLUS
CN Phosphine oxide, 1,1'-(6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[1,1-bis(3-methoxyphenyl)- (CA INDEX NAME)



REFERENCE COUNT: 65 THERE ARE 65 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 3 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2006:1119878 CAPLUS
DOCUMENT NUMBER: 147:211951
TITLE: Synthesis of new MeO-BIPHEP-type chiral diphosphines by an improved way
AUTHOR(S): Ma, Meng-Lin; Peng, Zong-Hai; Chen, Li; Guo, Yu; Chen, Hua; Li, Xian-Jun
CORPORATE SOURCE: Key Laboratory of Green Chemistry and Technology of Ministry of Education, Institute of Homogeneous Catalysis, Faculty of Chemistry, Sichuan University, Chengdu, Sichuan, 610064, Peop. Rep. China
SOURCE: Chinese Journal of Chemistry (2006), 24(10), 1391-1396
CODEN: CJOCEV; ISSN: 1001-604X
PUBLISHER: Shanghai Institute of Organic Chemistry
DOCUMENT TYPE: Journal
LANGUAGE: English
GI



I

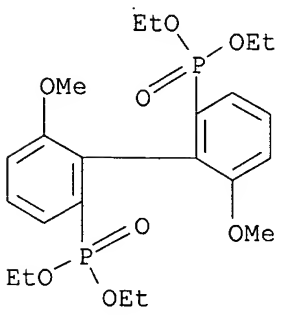
AB New optically active MeO-BIPHEP-type ligands, (S)-6,6'-dimethoxy-2,2'-bis(di-p-alkoxyphenyl-phosphine)-1,1'-biphenyl (S)-I [n = 0, 3, 7, 11, 15 (S)-5b-(S)-5e] were prepared and characterized. Starting from the com. available tri-Et phosphite and m-bromoanisole, an optically active (S)-6,6'-dimethoxybiphenyl-2,2'-diyl-bis(phosphonic acid diester) was prepared by an improved way and converted to the corresponding dichlorides, which was used as a key intermediate to react with p-alkoxybenzenemagnesium bromide or p-alkoxyphenyl Li to directly give the

enantiomerically pure diphosphines (S)-I.

IT 145265-38-9P
RL: PUR (Purification or recovery); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and conversion of chiral dimethoxybiphenyldiylbis(phosphonic acid diester) using aryl Grignard or lithium reagents to give enantiomerically pure biphenyl diphosphine ligands)

RN 145265-38-9 CAPLUS

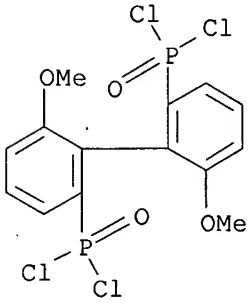
CN Phosphonic acid, P,P'-[(1S)-2',6-dimethoxy[1,1'-biphenyl]-2,6'-diyl]bis-, P,P,P',P'-tetraethyl ester (CA INDEX NAME)



IT 145265-40-3P 145265-44-7P 945028-74-0P
945028-76-2P 945028-78-4P 945028-80-8P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and conversion of chiral dimethoxybiphenyldiylbis(phosphonic acid diester) using aryl Grignard or lithium reagents to give enantiomerically pure biphenyl diphosphine ligands)

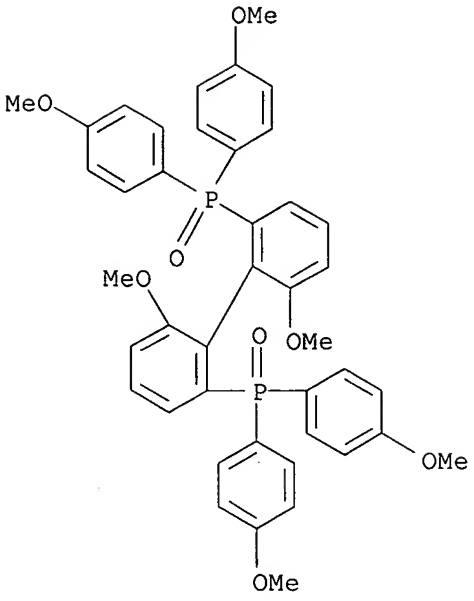
RN 145265-40-3 CAPLUS

CN Phosphonic dichloride, P,P'-[(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis- (CA INDEX NAME)

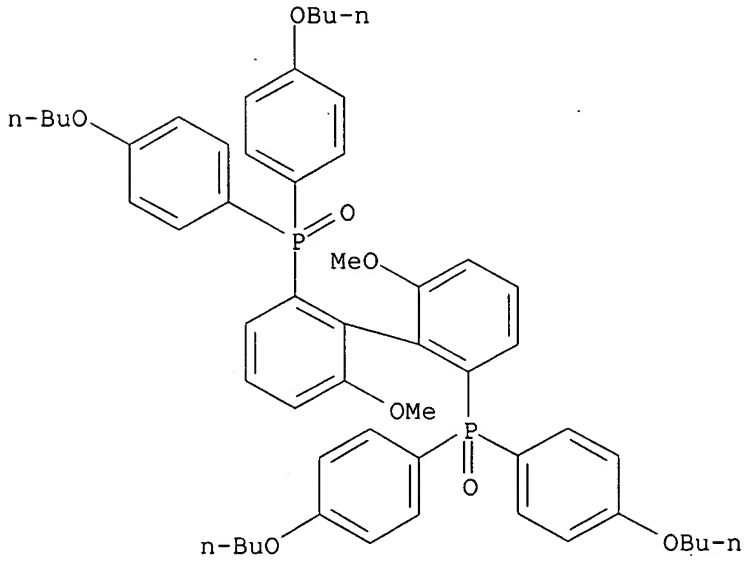


RN 145265-44-7 CAPLUS

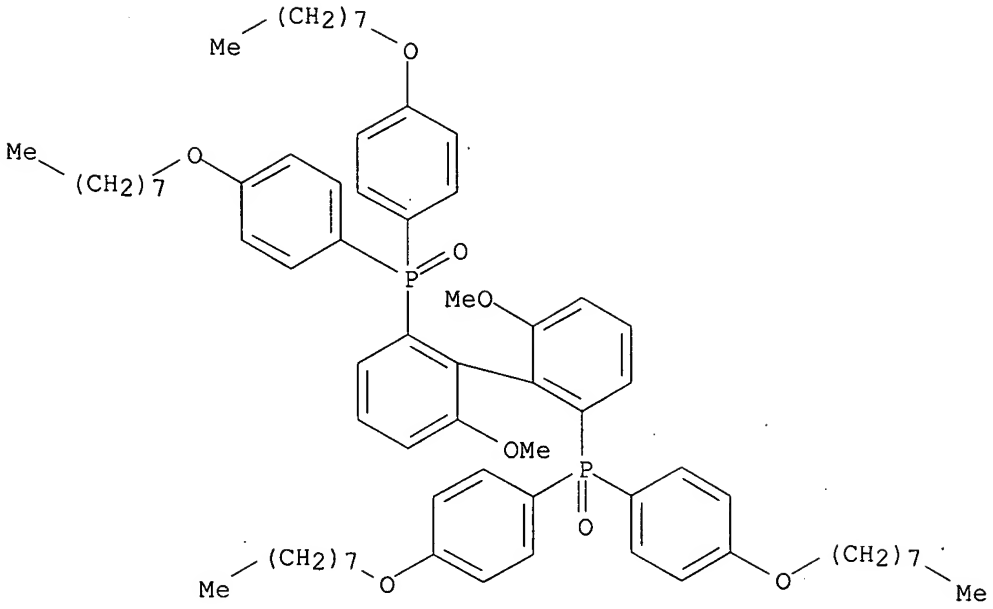
CN Phosphine oxide, 1,1'-[(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-bis(4-methoxyphenyl)- (CA INDEX NAME)



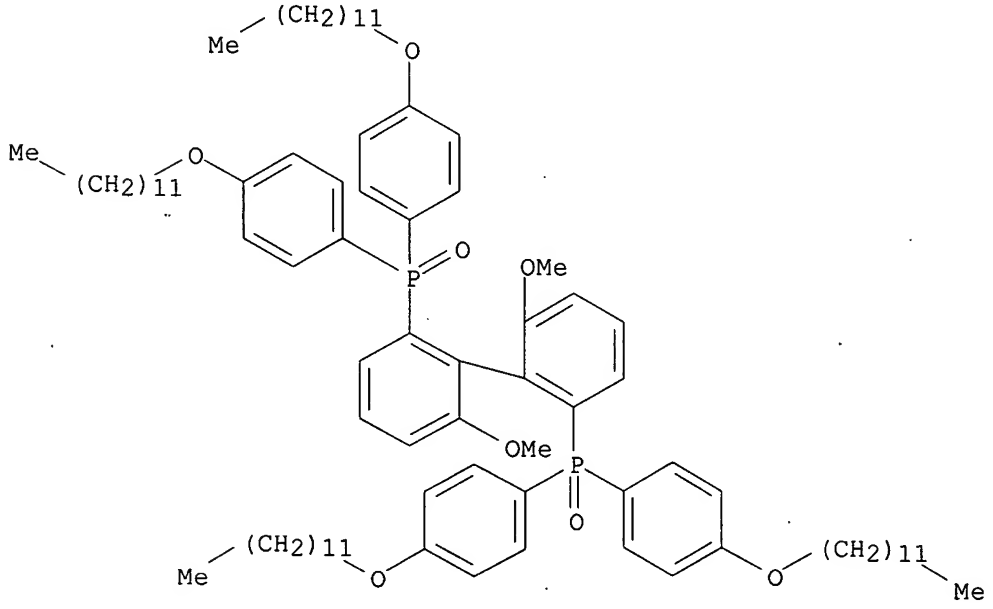
RN 945028-74-0 CAPLUS
CN Phosphine oxide, 1,1'-[(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-bis(4-butoxyphenyl)- (CA INDEX NAME)



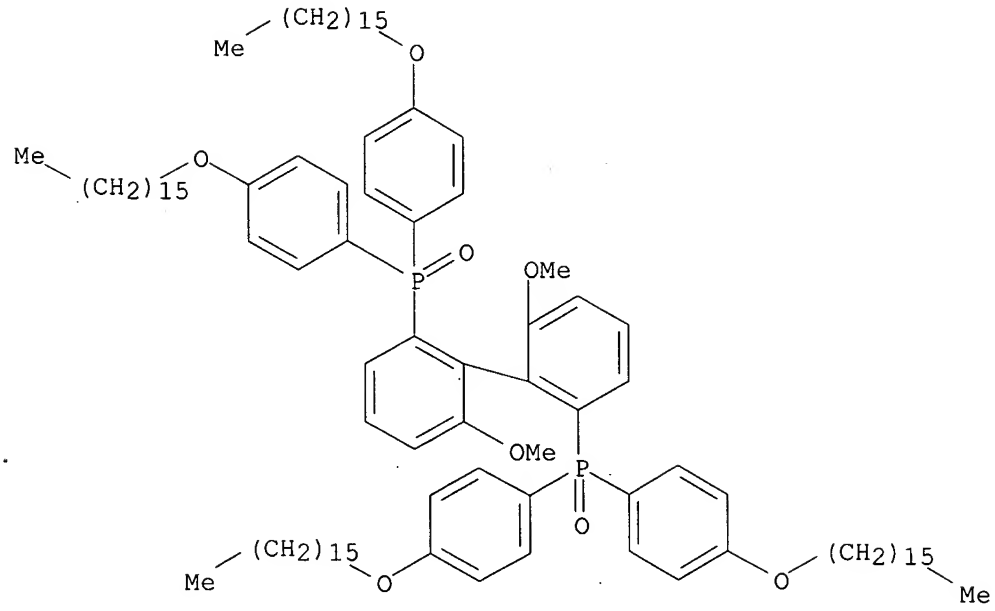
RN 945028-76-2 CAPLUS
CN Phosphine oxide, 1,1'-[(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-bis[4-(octyloxy)phenyl]- (CA INDEX NAME)



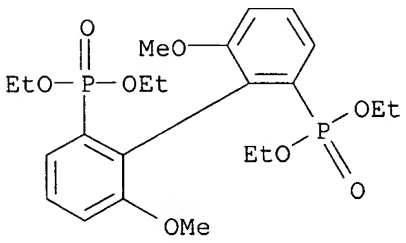
RN 945028-78-4 CAPLUS
CN Phosphine oxide, 1,1'-[(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-bis[4-(dodecyloxy)phenyl]- (CA INDEX NAME)



RN 945028-80-8 CAPLUS
CN Phosphine oxide, 1,1'-[(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-bis[4-(hexadecyloxy)phenyl]- (CA INDEX NAME)



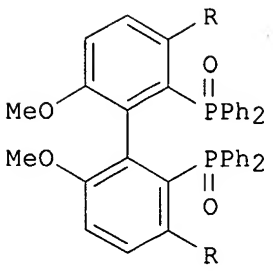
IT 145209-14-9P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(resolution; preparation and conversion of chiral dimethoxybiphenyldiylbis(phos
phonic acid diester) using aryl Grignard or lithium reagents to give enantiomerically pure biphenyl diphosphine ligands)
RN 145209-14-9 CAPLUS
CN Phosphonic acid, P,P'-(6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis-, P,P,P',P'-tetraethyl ester (CA INDEX NAME)



REFERENCE COUNT: 27 THERE ARE 27 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 4 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2006:433679 CAPLUS
DOCUMENT NUMBER: 145:82847
TITLE: Use of 1H NMR chemical shifts to determine the absolute configuration and enantiomeric purity for enantiomers of 3,3'-disubstituted-MeO-BIPHEP derivatives
AUTHOR(S): Gorobets, Evgueni; Parvez, Masood; Wheatley, Bronwen M. M.; Keay, Brian A.
CORPORATE SOURCE: Department of Chemistry, University of Calgary, Calgary, AB, T2N 1N4, Can.
SOURCE: Canadian Journal of Chemistry (2006), 84(2), 93-98
CODEN: CJCHAG; ISSN: 0008-4042
PUBLISHER: National Research Council of Canada
DOCUMENT TYPE: Journal
LANGUAGE: English

GI



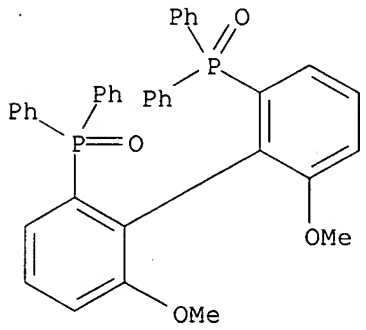
I

AB The absolute configuration of a series of 3,3'-disubstituted-MeO-BIPHEP derivs. (I; R= H, MeO,i-PrO,o-t-Bu,OPiv, Otolyl, i-Pr,Ph,mesityl) can be determined by the 1H NMR chemical shift of the methoxyl group when the 3,3'-disubstituted-MeO-BIPHEP derivative is mixed with (-)-(2R,3R)-dibenzoyltartaric acid ((-)-DBTA) (1:2) and its NMR spectrum is run in CDCl3. The chemical shift of the methoxyl group in the Sax enantiomer always occurred at higher field than the corresponding Rax enantiomer. Integration of the corresponding methoxyl signals provides the enantiomeric purity of any mixts.

IT 133577-82-9 133577-84-1
RL: PRP (Properties)
(use of 1H NMR chemical shifts to determine absolute configuration and enantiomeric
purity for enantiomers of 3,3'-disubstituted-MeO-BIPHEP derivs.)

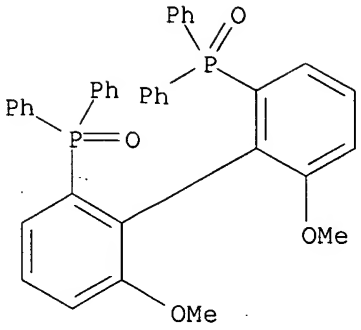
RN 133577-82-9 CAPLUS

CN Phosphine oxide, 1,1'-[(1R)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-diphenyl- (CA INDEX NAME)



RN 133577-84-1 CAPLUS

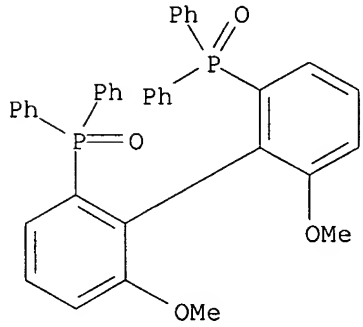
CN Phosphine oxide, 1,1'-[(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-diphenyl- (CA INDEX NAME)



IT 894100-06-2P 894100-13-1P
RL: PRP (Properties); PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation)
(use of 1H NMR chemical shifts to determine absolute configuration and enantiomeric
purity for enantiomers of 3,3'-disubstituted-MeO-BIPHEP derivs.)
RN 894100-06-2 CAPLUS
CN Butanedioic acid, 2,3-bis(benzoyloxy)-, (2R,3R)-, compd. with (1R)-(6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[diphenylphosphine oxide] (2:1) (9CI) (CA INDEX NAME)

CM 1

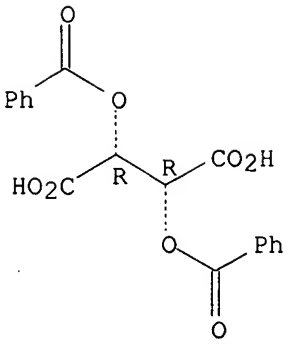
CRN 133577-82-9
CMF C38 H32 O4 P2



CM 2

CRN 2743-38-6
CMF C18 H14 O8

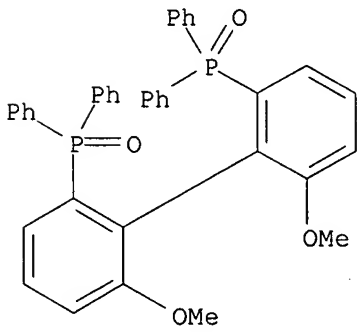
Absolute stereochemistry. Rotation (-).



RN 894100-13-1 CAPLUS
CN Butanedioic acid, 2,3-bis(benzoyloxy)-, (2R,3R)-, compd. with [(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[diphenylphosphine oxide] (2:1) (9CI) (CA INDEX NAME)

CM 1

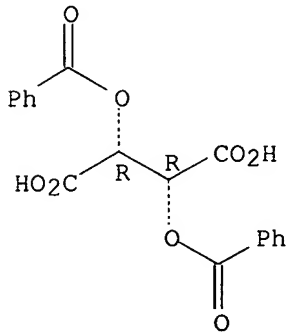
CRN 133577-84-1
CMF C38 H32 O4 P2



CM 2

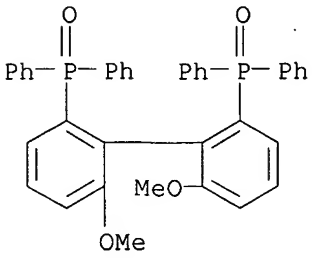
CRN 2743-38-6
CMF C18 H14 O8

Absolute stereochemistry. Rotation (-).



IT 133545-15-0
RL: RCT (Reactant); RACT (Reactant or reagent)
(use of 1H NMR chemical shifts to determine absolute configuration and enantiomeric

purity for enantiomers of 3,3'-disubstituted-MeO-BIPHEP derivs.)
RN 133545-15-0 CAPLUS
CN Phosphine oxide, 1,1'-(6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[1,1-diphenyl- (CA INDEX NAME)



REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 5 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2006:328224 CAPLUS
DOCUMENT NUMBER: 145:62371
TITLE: A new class of versatile chiral-bridged atropisomeric diphosphine ligands: remarkably efficient ligand syntheses and their applications in highly enantioselective hydrogenation reactions
AUTHOR(S): Qiu, Liqin; Kwong, Fuk Yee; Wu, Jing; Lam, Wai Har; Chan, Shusun; Yu, Wing-Yiu; Li, Yue-Ming; Guo, Rongwei; Zhou, Zhongyuan; Chan, Albert S. C.
CORPORATE SOURCE: Open Laboratory of Chirotechnology of the Institute of Molecular Technology for Drug Discovery and Synthesis and Department of Applied Biology and Chemical Technology, Hong Kong Polytechnic University, Hong Kong, Hong Kong
SOURCE: Journal of the American Chemical Society (2006), 128(17), 5955-5965
CODEN: JACSAT; ISSN: 0002-7863
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
GI

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

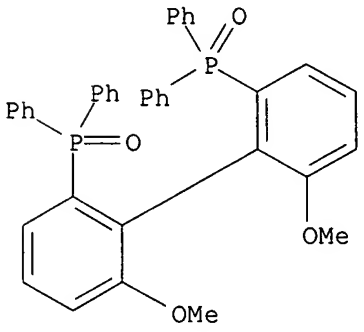
AB A series of chiral diphosphine ligands denoted as PQ-Phos (I, II, and III; n = 0, 1, 2) was prepared by atropdiastereoselective Ullmann coupling and ring-closure reactions. The Ullmann coupling reaction of the biaryl diphosphine dioxides (IV; n = same as above) is featured by highly efficient central-to-axial chirality transfer with diastereomeric excess >99%. This substrate-directed diastereomeric biaryl coupling reaction is unprecedented for the preparation of chiral diphosphine dioxides, and our method precludes the tedious resolution procedures usually required for preparing enantiomerically pure diphosphine ligands. The effect of chiral recognition was also revealed in a relevant asym. ring-closure reaction of (S)- or (R)-HO-BIPHEPO (V) or (VI) with chiral alkanediol dimesylate or ditosylate (VII; R = Ms, n = 0; R = Ts, n = 1 or 2). The chiral tether bridging the two aryl units creates a conformationally rigid scaffold essential for enantiofacial differentiation; fine-tuning of the ligand scaffold (e.g., dihedral angles) can be achieved by varying the chain length of the chiral tether. The enantiomerically pure Ru- and Ir-PQ-Phos complexes have been prepared and applied to the catalytic enantioselective

hydrogenations of α- and β-ketoesters (C:O bond reduction) of formula R1COCO2R2 (R1 = Me or Ph, R2 = Me; R1 = Me, iso-Pr, Ph, or PhCH2CH2) and R1COCHR2CO2R3 (R1 = Me, R2 = H, R3 = Me, Et, or CH2Ph; R1 = ClCH2 or Ph, R2 = H, R3 = Et; R1 = Ph, R2 = Cl, R3 = Et) to chiral α- or β-hydroxy esters of formula R1CH(OH)CO2R2 and R1CH(OH)CHR2CO2R3, 2-(6'-methoxy-2'-naphthyl)propenoic acid, alkyl-substituted β-dehydroamino acids (C:C bond reduction) of formula R2O2CCH:C(R1)NHAc (R1 = Me, Et, iso-Pr, or tert-Bu, R2 = me; R1 = Me or n-Pr, R2 = Et) to chiral β-amino acid esters of formula R2O2CCH2CHC(R1)NHAc, and N-heteroarom. compds. (C:N bond reduction) (VIII; R1 = Me, R2 = Me, H, MeO; R1 = Ph, R2 = H), (IX), and (X) to chiral heterocyclic compds. (XI), (XII), and (XIII). An excellent level of enantioselection (up to 99.9% ee) has been attained for the catalytic reactions. In addition, the significant ligand dihedral angle effects on the Ir-catalyzed asym. hydrogenation of N-heteroarom. compds. were also revealed.

IT 133577-84-1DP, ruthenium complexes
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(preparation of versatile chiral-bridged atropisomeric diphosphine ligands by stereoselective ring-closure of (S)- or (R)-HO-BIPHEPO with chiral alkanediol dimesylate or ditosylate)

RN 133577-84-1 CAPLUS

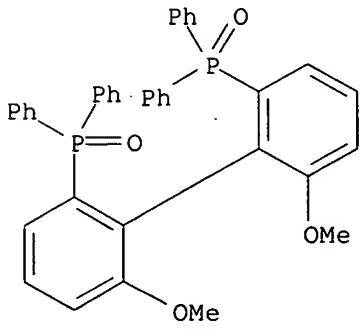
CN Phosphine oxide, 1,1'-[(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-diphenyl- (CA INDEX NAME)



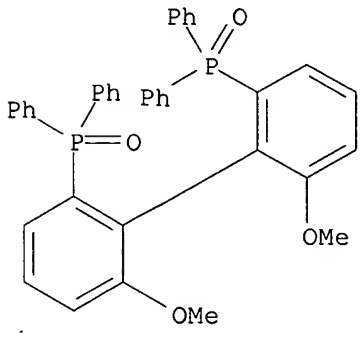
IT 133577-82-9, (R)-MeOBIPHEPO 133577-84-1, (S)-MeOBIPHEPO
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of versatile chiral-bridged atropisomeric diphosphine ligands by stereoselective ring-closure of (S)- or (R)-HO-BIPHEPO with chiral alkanediol dimesylate or ditosylate)

RN 133577-82-9 CAPLUS

CN Phosphine oxide, 1,1'-[(1R)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-diphenyl- (CA INDEX NAME)

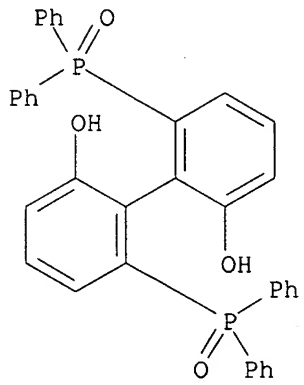


RN 133577-84-1 CAPLUS
CN Phosphine oxide, 1,1'-[(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-diphenyl- (CA INDEX NAME)

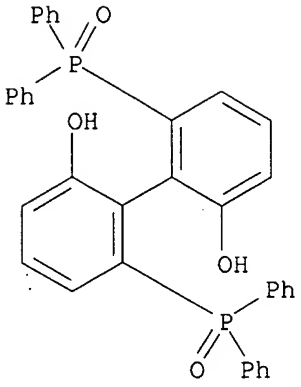


IT 524711-75-9P 679422-50-5P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation of versatile chiral-bridged atropisomeric diphosphine ligands by stereoselective ring-closure of (S)- or (R)-HO-BIPHEPO with chiral alkanediol dimesylate or ditosylate)

RN 524711-75-9 CAPLUS
CN [1,1'-Biphenyl]-2,2'-diol, 6,6'-bis(diphenylphosphinyl)-, (1R)- (9CI) (CA INDEX NAME)

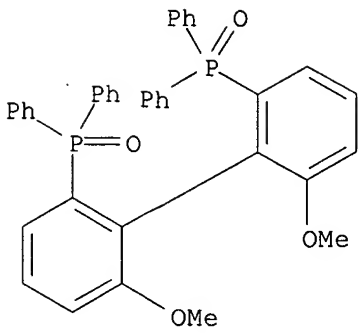


RN 679422-50-5 CAPLUS
CN [1,1'-Biphenyl]-2,2'-diol, 6,6'-bis(diphenylphosphinyl)-, (1S)- (9CI) (CA INDEX NAME)

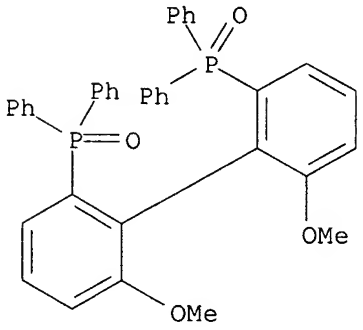


REFERENCE COUNT: 130 THERE ARE 130 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

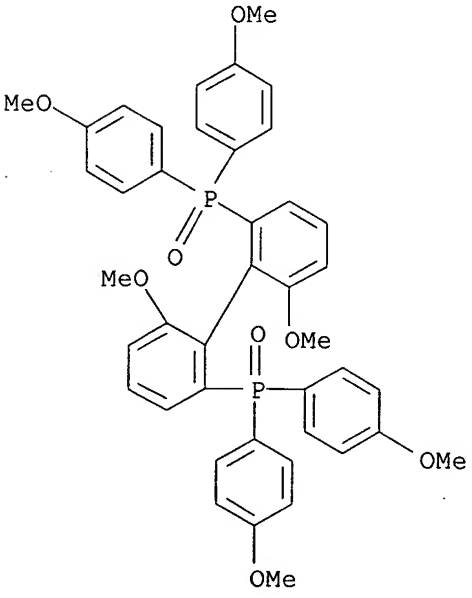
L3 ANSWER 6 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2006:219844 CAPLUS
DOCUMENT NUMBER: 146:62793
TITLE: Improvement on the synthesis of chiral biphenyl diphosphine ligands
AUTHOR(S): Fang, Chun-Mei; Ma, Meng-Lin; Zheng, Xue-Li; Guo, Yu; Peng, Zong-Hai; Chen, Hua; Li, Xian-Jun
CORPORATE SOURCE: Key Laboratory of Green Chemistry and Technology of Ministry of Education, Institute of Homogeneous Catalysis, Department of Chemistry, Sichuan University, Chengdu, 610064, Peop. Rep. China
SOURCE: Youji Huaxue (2006), 26(2), 252-255
CODEN: YCHHDX; ISSN: 0253-2786
PUBLISHER: Youji Huaxue Bianjibu
DOCUMENT TYPE: Journal
LANGUAGE: Chinese
OTHER SOURCE(S): CASREACT 146:62793
AB The chiral diphosphines, R- and S-(6,6'-dimethoxy)-2,2'-bis(diarylphosphino)-1,1'-biphenyl, (aryl = Ph, 4-C6H4OMe) have been prepared with six steps from com. available 3-bromoanisole by a concise synthetic route. This approach was also an efficient synthetic method for biphenyl diphosphines with different diarylphosphino groups.
IT 133577-82-9P 133577-84-1P 145265-43-6P
145265-44-7P
RL: PUR (Purification or recovery); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation of chiral biphenyl diphosphine ligands starting from bromoanisole)
RN 133577-82-9 CAPLUS
CN Phosphine oxide, 1,1'-[(1R)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-diphenyl- (CA INDEX NAME)



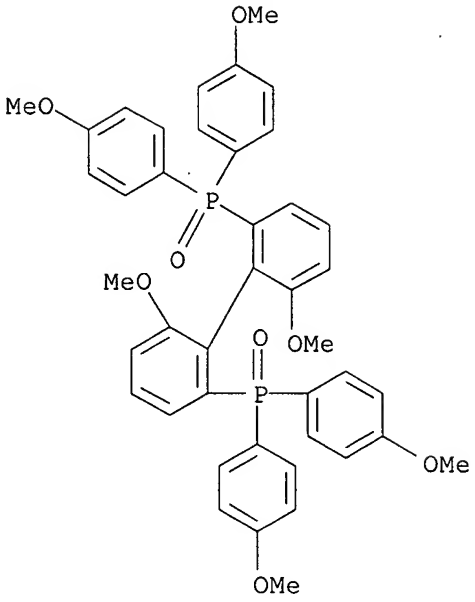
RN 133577-84-1 CAPLUS
CN Phosphine oxide, 1,1'-[(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-diphenyl- (CA INDEX NAME)



RN 145265-43-6 CAPLUS
CN Phosphine oxide, 1,1'-[(1R)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-bis(4-methoxyphenyl)- (CA INDEX NAME)

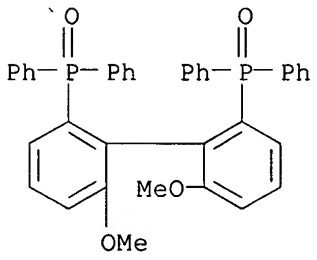


RN 145265-44-7 CAPLUS
CN Phosphine oxide, 1,1'-[(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-bis(4-methoxyphenyl)- (CA INDEX NAME)

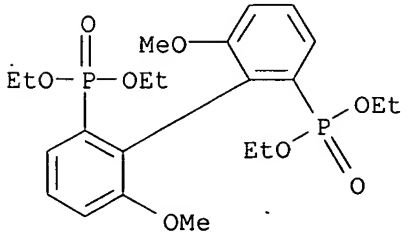


IT 133545-15-0P 145209-14-9P 145209-18-3P
145209-27-4P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation of chiral biphenyl diphosphine ligands starting from bromoanisole)

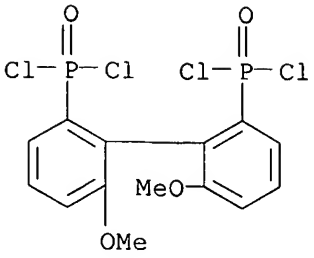
RN 133545-15-0 CAPLUS
CN Phosphine oxide, 1,1'-(6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[1,1-diphenyl- (CA INDEX NAME)



RN 145209-14-9 CAPLUS
CN Phosphonic acid, P,P'-(6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis-, P,P,P',P'-tetraethyl ester (CA INDEX NAME)

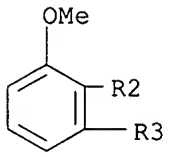


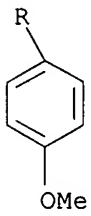
RN 145209-18-3 CAPLUS
CN Phosphonic dichloride, P,P'-(6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis- (CA INDEX NAME)



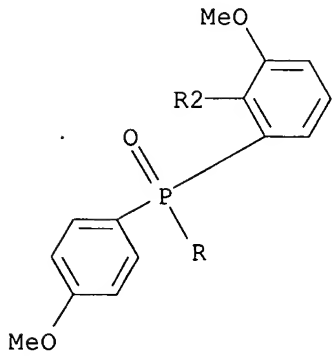
RN 145209-27-4 CAPLUS
CN Phosphine oxide, 1,1'-(6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[1,1-bis(4-methoxyphenyl)- (CA INDEX NAME)

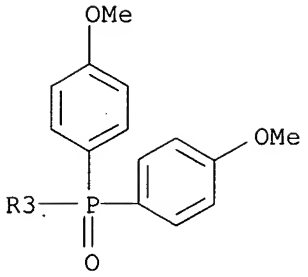
PAGE 1-A





PAGE 2-A

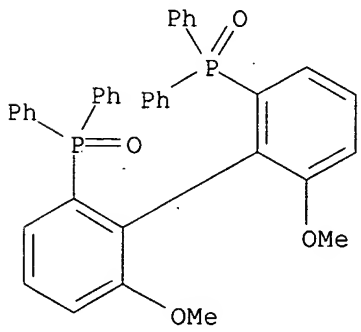




L3 ANSWER 7 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2006:208444 CAPLUS
DOCUMENT NUMBER: 144:450471
TITLE: Diastereospecific Intramolecular Ullmann Couplings: Unique Chiral Auxiliary for the Preparation of 3,3'-Disubstituted MeO-BIPHEP Derivatives
AUTHOR(S): Gorobets, E.; McDonald, R.; Keay, B. A.
CORPORATE SOURCE: Department of Chemistry, University of Calgary, Calgary, T2N 1N4, Can.
SOURCE: Organic Letters (2006), 8(7), 1483-1485
CODEN: ORLEF7; ISSN: 1523-7060
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 144:450471

AB A chiral auxiliary is described that provides only one diastereomer during intramol. Ullmann couplings. Treatment of five Ullmann coupling precursors with Cu powder in DMF at 115 °C provides 2,2',3,3',6,6'-hexasubstituted 1,1'-biphenyls as single diastereomers in yields ranging from 66% to 91%.

IT 133577-84-1P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of 3,3'-disubstituted MeO-BIPHEP derivs. by diastereospecific intramol. Ullmann couplings using a unique chiral auxiliary)
RN 133577-84-1 CAPLUS
CN Phosphine oxide, 1,1'-[(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-diphenyl- (CA INDEX NAME)



REFERENCE COUNT: 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 8 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2006:88172 CAPLUS
DOCUMENT NUMBER: 145:396761
TITLE: Dendritic BIPHEP: Synthesis and application in

asymmetric hydrogenation of β-keto esters

AUTHOR(S): Deng, Guo-Jun; Li, Guo-Rui; Zhu, Ling-Yun; Zhou, Hai-Feng; He, Yan-Mei; Fan, Qing-Hua; Shuai, Zhi-Gang

CORPORATE SOURCE: Laboratory of Chemical Biology, Center for Molecular Science, Institute of Chemistry, Chinese Academy of Sciences, Beijing, 100080, Peop. Rep. China

SOURCE: Journal of Molecular Catalysis A: Chemical (2006), 244(1-2), 118-123
CODEN: JMCCF2; ISSN: 1381-1169

PUBLISHER: Elsevier B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

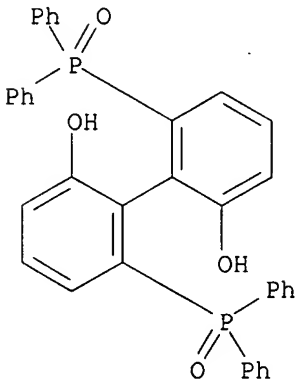
OTHER SOURCE(S): CASREACT 145:396761

AB A series of new chiral dendritic biphenyldiphosphine ligands were prepared and their applications in the Ru-catalyzed asym. hydrogenation of β-keto esters were investigated. Ruthenium catalysts containing these dendrimer ligands were effective in the hydrogenation of β-keto esters. The size of the dendritic wedges influenced the enantioselectivity significantly.

IT 524711-75-9P 911438-18-1P 911438-19-2P
911438-20-5P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation of dendritic biphenyldiphosphine ligands for ruthenium-catalyzed asym. hydrogenation of β-keto esters)

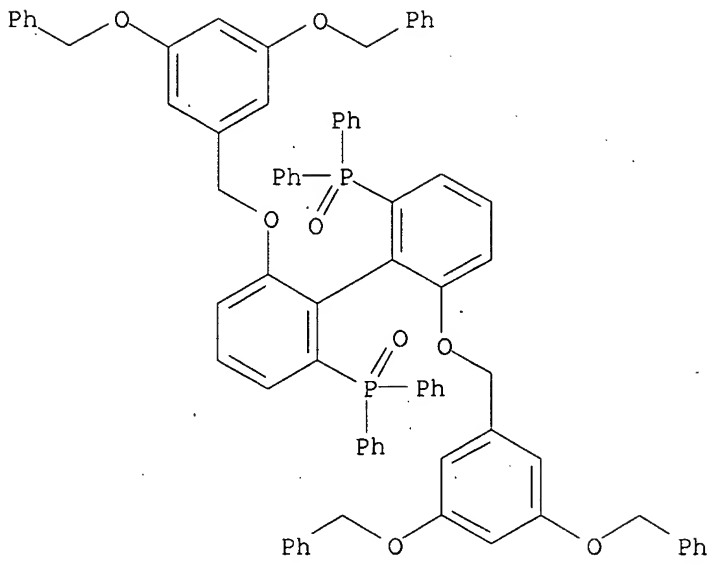
RN 524711-75-9 CAPLUS

CN [1,1'-Biphenyl]-2,2'-diol, 6,6'-bis(diphenylphosphinyl)-, (1R)- (9CI) (CA INDEX NAME)

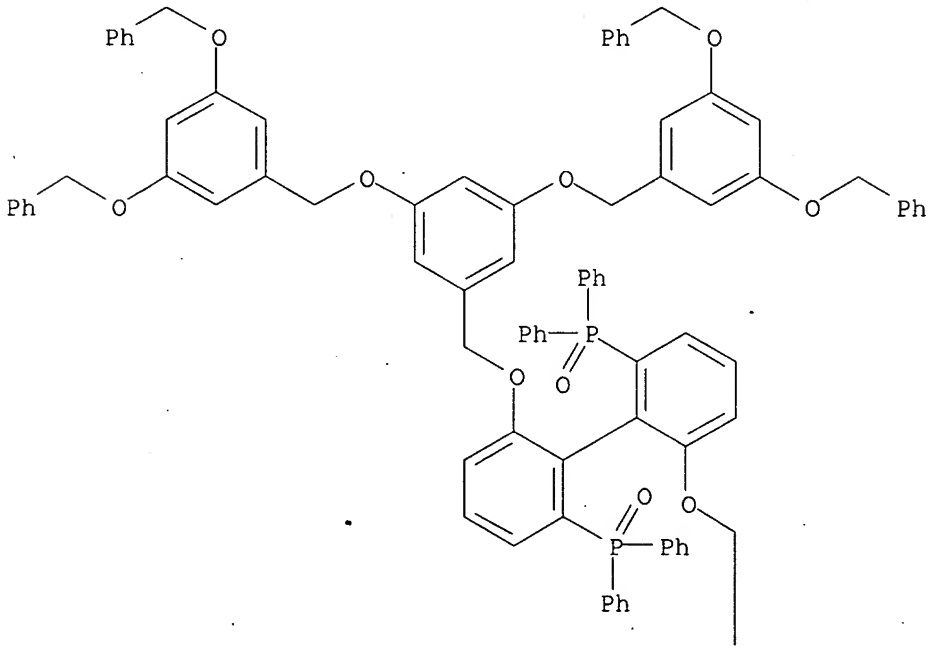


RN 911438-18-1 CAPLUS

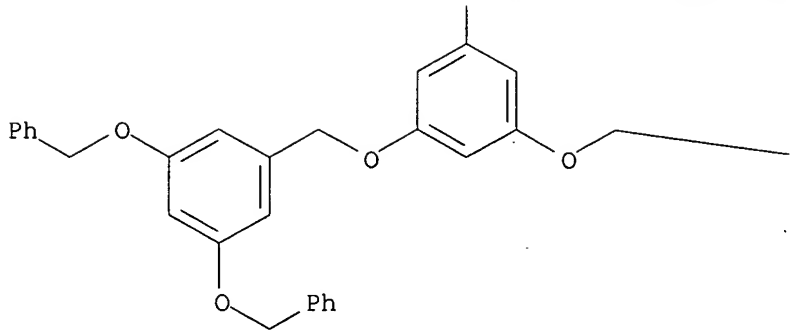
CN Phosphine oxide, [(1R)-6,6'-bis[[3,5-bis(phenylmethoxy)phenyl]methoxy][1,1'-biphenyl]-2,2'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



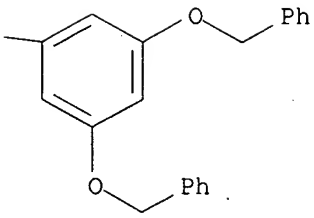
RN 911438-19-2 CAPLUS
CN Phosphine oxide, [(1R)-6,6'-bis[[3,5-bis[[3,5-bis(phenylmethoxy)phenyl]methoxy]phenyl]methoxy][1,1'-biphenyl]-2,2'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



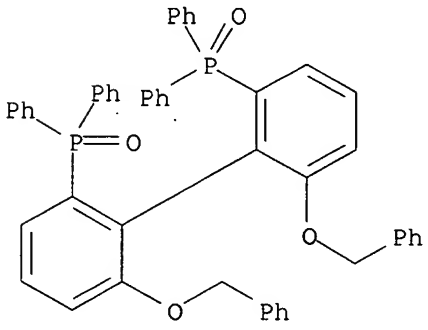
PAGE 2-A



PAGE 2-B



RN 911438-20-5 CAPLUS
CN Phosphine oxide, [(1R)-6,6'-bis(phenylmethoxy)[1,1'-biphenyl]-2,2'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 70 THERE ARE 70 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 9 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2005:621820 CAPLUS
DOCUMENT NUMBER: 143:286065
TITLE: Cu(I)-Catalyzed Direct Enantioselective Cross Aldol-Type Reaction of Acetonitrile
AUTHOR(S): Suto, Yutaka; Tsuji, Riichiro; Kanai, Motomu; Shibasaki, Masakatsu
CORPORATE SOURCE: Graduate School of Pharmaceutical Sciences, The University of Tokyo, Tokyo, 113-0033, Japan
SOURCE: Organic Letters (2005), 7(17), 3757-3760
CODEN: ORLEF7; ISSN: 1523-7060

PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 143:286065

AB Direct catalytic enantioselective cross aldol-type reaction of aldehydes RCHO (R = Me2CHCH2, cyclohexyl, Ph, PhCH2, n-hexyl, etc.) with acetonitrile to give β-hydroxynitriles RCHOHCH2CN was developed using Cu alkoxide-chiral phosphine complexes as catalysts. Chemoselective activation and deprotonation of the donor substrate (acetonitrile) by the soft metal alkoxide in a strongly donating solvent (HMPA) are key to success in this reaction. Useful chemical yields and promising enantioselectivities are produced using either DTBM-SEGPHOS or a tuned BIPHEP as a chiral ligand.

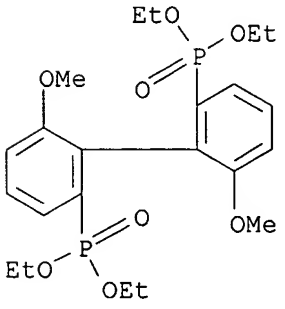
IT 864365-86-6P
RL: PUR (Purification or recovery); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation of biphenyl diphosphine as chiral ligand for Cu(I)-catalyzed direct cross aldol-type reaction of aldehydes with acetonitrile)

RN 864365-86-6 CAPLUS

CN Butanedioic acid, 2,3-bis(benzoyloxy)-, (2S,3S)-, compd. with tetraethyl [(1R)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[phosphonate] (1:1) (9CI) (CA INDEX NAME)

CM 1

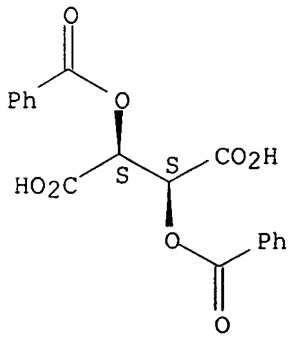
CRN 145264-54-6
CMF C22 H32 O8 P2



CM 2

CRN 17026-42-5
CMF C18 H14 O8

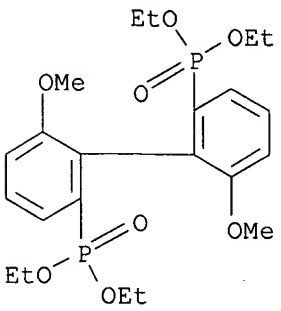
Absolute stereochemistry. Rotation (+).



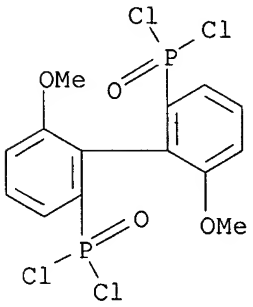
IT 145264-54-6P 145265-39-0P 864365-87-7P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation of biphenyl diphosphine as chiral ligand for Cu(I)-catalyzed direct cross aldol-type reaction of aldehydes with acetonitrile)

RN 145264-54-6 CAPLUS
CN Phosphonic acid, [(1R)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis-, tetraethyl ester (9CI) (CA INDEX NAME)

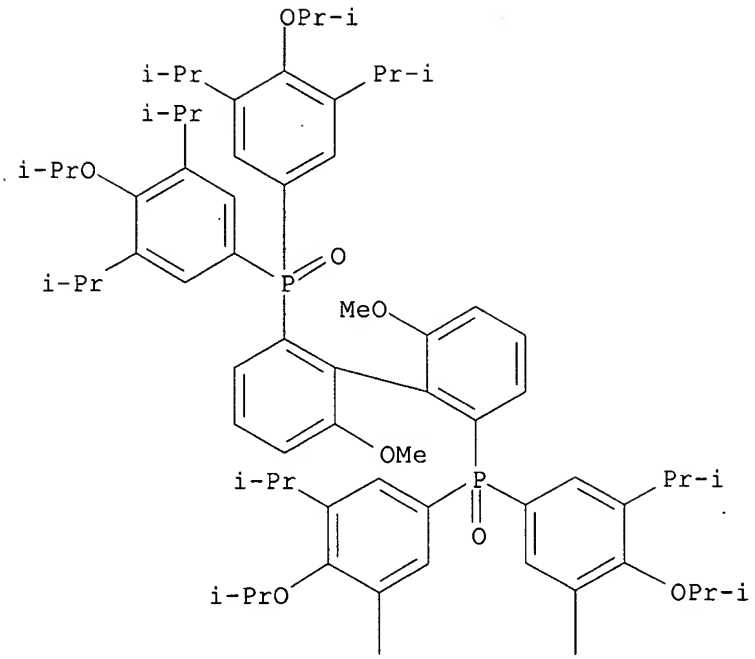


RN 145265-39-0 CAPLUS
CN Phosphonic dichloride, [(1R)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis- (9CI) (CA INDEX NAME)



RN 864365-87-7 CAPLUS
CN Phosphine oxide, [(1R)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[bis[4-(1-methylethoxy)-3,5-bis(1-methylethyl)phenyl]- (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 2-A

REFERENCE COUNT: 32 THERE ARE 32 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

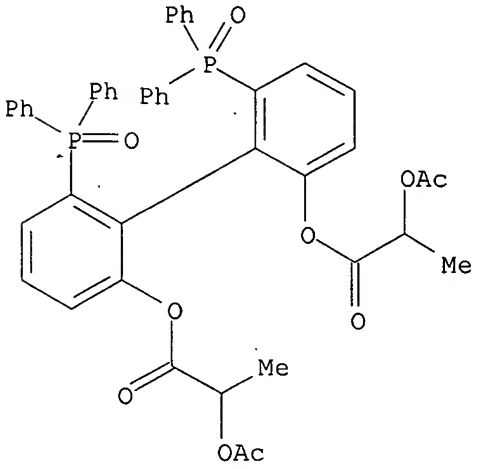
L3 ANSWER 10 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2005:378835 CAPLUS
DOCUMENT NUMBER: 143:78246
TITLE: Avoiding the classical resolution during the synthesis of MeO-BIPHEP and 3,3'-disubstituted derivatives
AUTHOR(S): Gorobets, Evgueni; Wheatley, Bronwen M. M.; Hopkins, J. Matthew; McDonald, Robert; Keay, Brian A.
CORPORATE SOURCE: Department of Chemistry, University of Calgary, Calgary, AB, T2N 1N4, Can.
SOURCE: Tetrahedron Letters (2005), 46(22), 3843-3846
CODEN: TELEAY; ISSN: 0040-4039
PUBLISHER: Elsevier B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 143:78246

AB The Ullmann coupling of a (S)-2-acetoxy propionyl chloride-derived iododiphenylphosphinyl benzene derivative gave a a 2:1 mixture of diastereomers in 81% yield that are easily separated by silica gel chromatog. This procedure avoids the generally cumbersome and sometimes difficult resolution step with DBTA. Similar Ullmann couplings and separation of the corresponding diastereomers are employed with other (S)-2-acetoxy propionyl chloride-derived iodo diphenylphosphinyl benzene derivs. or (R)-2-acetoxy propionyl chloride-derived iodo diphenylphosphinyl benzene derivs. ultimately affording a new series of 3,3'-disubstituted-MeO-BIPHEP derivs. The use of these new derivs. in a palladium-catalyzed asym. Heck reaction, a Pd-catalyzed asym. polyene cyclization reaction, and a rhodium-catalyzed

enantioselective hydrogenation is also reported.

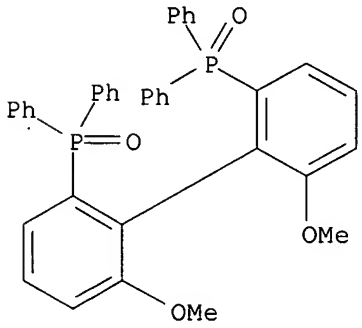
IT 855300-66-2P
RL: SPN (Synthetic preparation); PREP (Preparation)
(minor diastereomer formed in the preparation of a nonracemic biphenyldiphosphine using the stereoselective Ullmann coupling of a (diphenylphosphinyl)iodophenyl ester of (S)-acetyllactic acid as the key step)

RN 855300-66-2 CAPLUS
CN Propanoic acid, 2-(acetyloxy)-, (1S)-6,6'-bis(diphenylphosphinyl)[1,1'-biphenyl]-2,2'-diyl ester, (2S,2'S)- (9CI) (CA INDEX NAME)

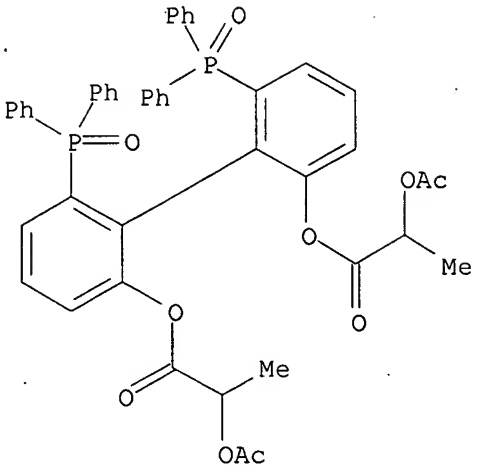


IT 133577-82-9P 855300-65-1P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation of nonracemic biphenyldiphosphines using the stereoselective Ullmann coupling of (diphenylphosphinyl)iodophenyl esters of acetyllactic acids as the key step)

RN 133577-82-9 CAPLUS
CN Phosphine oxide, 1,1'-[(1R)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-diphenyl- (CA INDEX NAME)



RN 855300-65-1 CAPLUS
CN Propanoic acid, 2-(acetyloxy)-, (1R)-6,6'-bis(diphenylphosphinyl)[1,1'-biphenyl]-2,2'-diyl ester, (2S,2'S)- (9CI) (CA INDEX NAME)

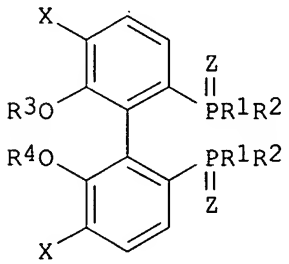


REFERENCE COUNT: 21 THERE ARE 21 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 11 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2005:253273 CAPLUS
DOCUMENT NUMBER: 142:316957
TITLE: Preparation of chiral biphenyl-2,2'-diyl diphosphines substituted by alkoxycarbonyl groups for use in asymmetric hydrogenation of ketones and imines
INVENTOR(S): Artl, Dieter; Meseguer, Benjamin
PATENT ASSIGNEE(S): Bayer Chemicals A.-G., Germany
SOURCE: Eur. Pat. Appl., 20 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1516880	A1	20050323	EP 2004-21174	20040907
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, HR				
DE 10342672	A1	20050421	DE 2003-10342672	20030916
JP 2005089462	A	20050407	JP 2004-267421	20040914
US 20050085377	A1	20050421	US 2004-940785	20040914

PRIORITY APPLN. INFO.: DE 2003-10342672 A 20030916
OTHER SOURCE(S): MARPAT 142:316957
GI



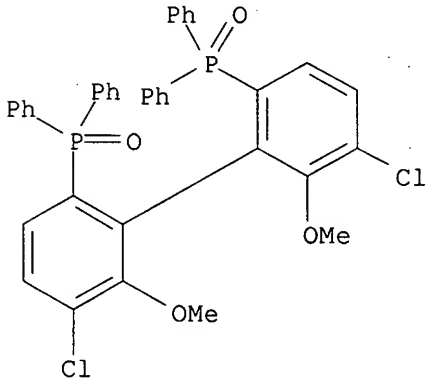
AB Chiral (1R)- and (1S)-1,1'-biphenyl-2,2'-bis(phosphines) (I, Z = none, X = H, Cl, Br; R1 = R2 = Ph, cyclohexyl, 3,5-tBu-4-MeOC6H2, 3,5-Me2-4-MeOC6H2, 3,5-tBu2C6H3, 4-FC6H4; R3 = R4 = RO2CCH2, RO2CCHMe, where R = Me, Et; or

R3 = cyclohexyl, R4 = RO2CCH2, RO2CCHMe, same R), useful as ligands for asym. hydrogenation of prochiral ketones and imines (no data) and acetoacetate, were prepared by demethylation of corresponding phosphine oxides I (Z = O; R3 = R4 = Me, same X, R1, R2), followed by etherification of 6,6'-diols with R3Y, preferably cyclohexyl bromide, and RO2CCH2Br or RO2CCHMeBr and reduction by HSiCl3 and used as ligands for asym. hydrogenation of Et acetoacetate and Et chloroacetate. In an example, compound (S)-I (Z = O, X = Cl, R3 = R4 = H, R1 = R2 = Ph) was prepared by reaction of the corresponding dimethoxy-derivative with BBr3, followed by water hydrolysis; the diol was reacted with MeO2CH2Br to give I (Z = O, X = Cl, R3 = R4 = MeO2CCH2, R1 = R2 = Ph), which was reduced by HSiCl3 to give the corresponding diphosphine I (5, Z = none, same X, R1-R4). Asym. hydrogenation of Me acetoacetate in the presence of 0.02 mol% of 5 and 0.01 mol% of RuCl3 in ethanol under 90 atm of H2 for 1 h at 80° gave Me 3-hydroxybutyrate with 97.4 % ee.

IT 185913-95-5
RL: RCT (Reactant); RACT (Reactant or reagent)
(demethylation; preparation of axial-chiral biphenyl-2,2'-diphosphines containing alkoxycarbonylalkoxy groups as ligands for asym. hydrogenation of ketones)

RN 185913-95-5 CAPLUS

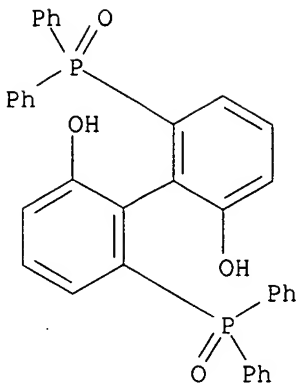
CN Phosphine oxide, [(1S)-5,5'-dichloro-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



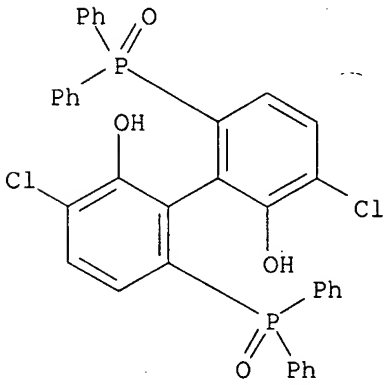
IT 679422-50-5P 691363-03-8P 848078-14-8P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(etherification; preparation of axial-chiral biphenyl-2,2'-diphosphines containing alkoxycarbonylalkoxy groups as ligands for asym. hydrogenation of ketones)

RN 679422-50-5 CAPLUS

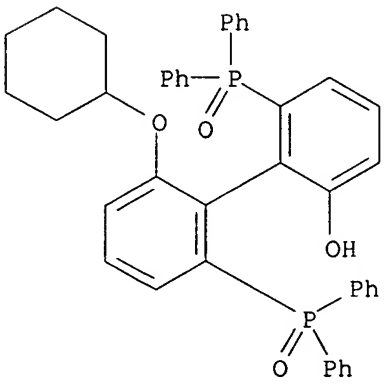
CN [1,1'-Biphenyl]-2,2'-diol, 6,6'-bis(diphenylphosphinyl)-, (1S)- (9CI) (CA INDEX NAME)



RN 691363-03-8 CAPLUS
CN [1,1'-Biphenyl]-2,2'-diol, 3,3'-dichloro-6,6'-bis(diphenylphosphinyl)-, (1S)- (9CI) (CA INDEX NAME)

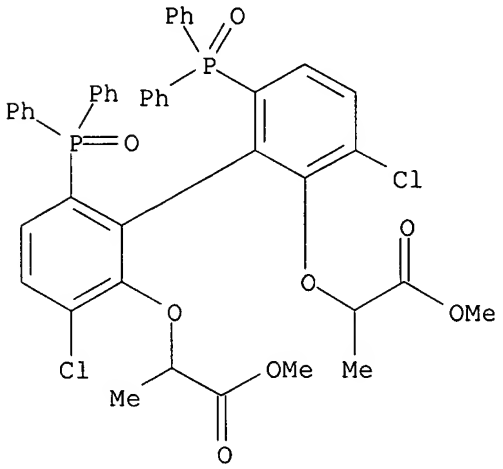


RN 848078-14-8 CAPLUS
CN [1,1'-Biphenyl]-2-ol, 2'-(cyclohexyloxy)-6,6'-bis(diphenylphosphinyl)-, (1S)- (9CI) (CA INDEX NAME)

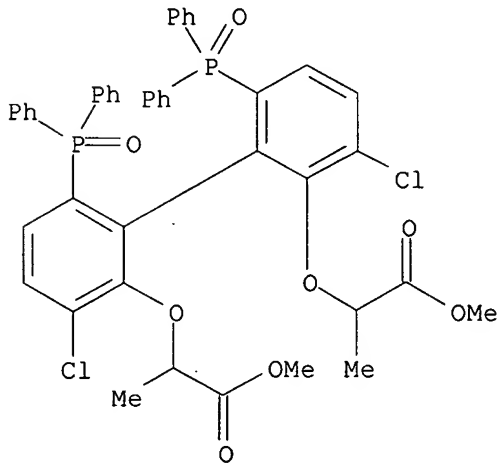


IT 848078-16-0P 848078-17-1P
RL: PUR (Purification or recovery); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(reduction; preparation of axial-chiral biphenyl-2,2'-diphosphines containing
alkoxycarbonylalkoxy groups as ligands for asym. hydrogenation of

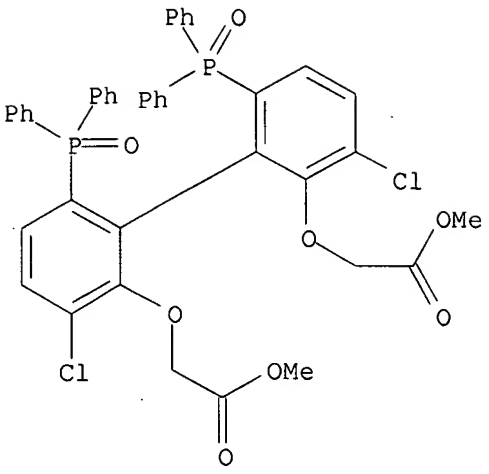
ketones)
RN 848078-16-0 CAPLUS
CN Propanoic acid, 2,2'-[[(1S)-3,3'-dichloro-6,6'-bis(diphenylphosphinyl)[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis-, dimethyl ester (9CI) (CA INDEX NAME)



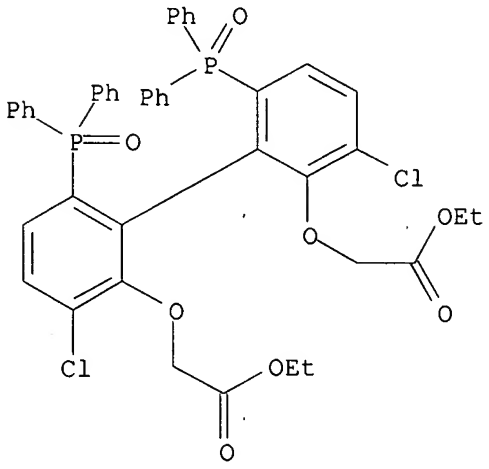
RN 848078-17-1 CAPLUS
CN Propanoic acid, 2,2'-[[(1S)-3,3'-dichloro-6,6'-bis(diphenylphosphinyl)[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis-, dimethyl ester, (2R,2'S)- (9CI) (CA INDEX NAME)



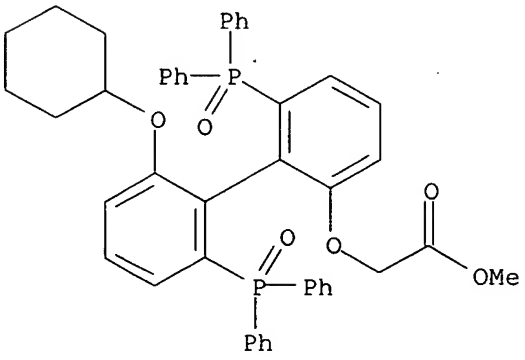
IT 848078-12-6P 848078-13-7P 848078-15-9P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(reduction; preparation of axial-chiral biphenyl-2,2'-diphosphines containing
alkoxycarbonylalkoxy groups as ligands for asym. hydrogenation of ketones)
RN 848078-12-6 CAPLUS
CN Acetic acid, 2,2'-[[(1S)-3,3'-dichloro-6,6'-bis(diphenylphosphinyl)[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis-, dimethyl ester (9CI) (CA INDEX NAME)



RN 848078-13-7 CAPLUS
CN Acetic acid, 2,2'-[[(1S)-3,3'-dichloro-6,6'-bis(diphenylphosphinyl)[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis-, diethyl ester (9CI) (CA INDEX NAME)



RN 848078-15-9 CAPLUS
CN Acetic acid, [[(1S)-2'-(cyclohexyloxy)-6,6'-bis(diphenylphosphinyl)[1,1'-biphenyl]-2-yl]oxy]-, methyl ester (9CI) (CA INDEX NAME)

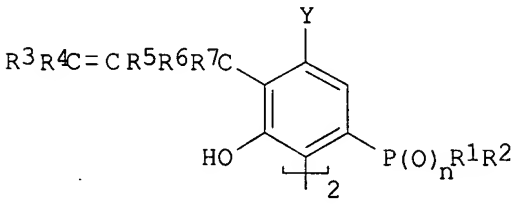


REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 12 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2005:159895 CAPLUS
DOCUMENT NUMBER: 142:240572
TITLE: Preparation of allyloxybiphenyl phosphorus ligands for enantioselective catalysis
INVENTOR(S): Arlt, Dieter
PATENT ASSIGNEE(S): Germany
SOURCE: Ger. Offen., 5 pp.
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 10335950	A1	20050224	DE 2003-10335950	20030804

PRIORITY APPLN. INFO.: DE 2003-10335950 20030804
OTHER SOURCE(S): CASREACT 142:240572; MARPAT 142:240572
GI

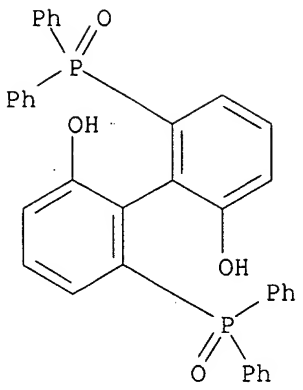


I

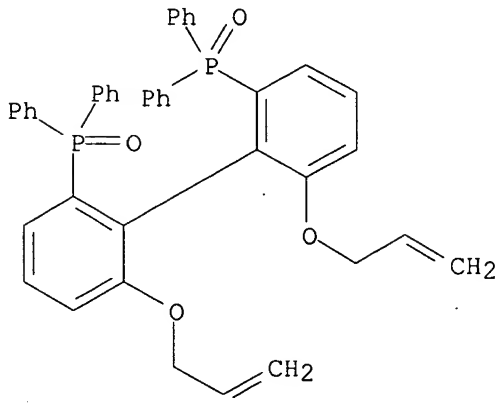
AB Preparation of 6,6'-bis-allyloxybiphenyl derivs., I (R1, R2 = alkoxy, aryloxy, alkyl, cycloalkyl, aryl, hetaryl, etc.; R3-R7 = H, alkyl, aryl, etc.; Y = H, alkyl, alkoxy, etc.; n = 0-1), contained phosphorus in 2 and 2'-position, useful as ligands for transition metal complexes, which are useful as catalysts for enantioselective hydrogenations and isomerizations, is described. These rearrangement products, if they are present in chiral form, can be converted by a new isomerization procedure into mixts. of the atropisomers. Thus, reaction of (R)-(6,6'-dihydroxybiphenyl-2,2'-diyl) bis(diphenylphosphine oxide) with K2CO3 in DMF gave 90.7% (R)-(6,6'-bisallyloxybiphenyl-2,2'-diyl) bis(diphenylphosphine oxide).

IT 524711-75-9
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of allyloxybiphenyl phosphorus ligands for transition metal catalyzed enantioselective catalysis)

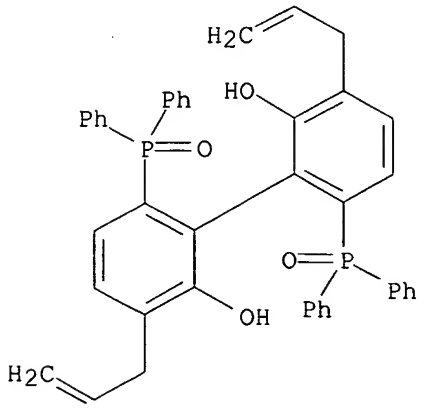
RN 524711-75-9 CAPLUS
CN [1,1'-Biphenyl]-2,2'-diol, 6,6'-bis(diphenylphosphinyl)-, (1R)- (9CI) (CA INDEX NAME)



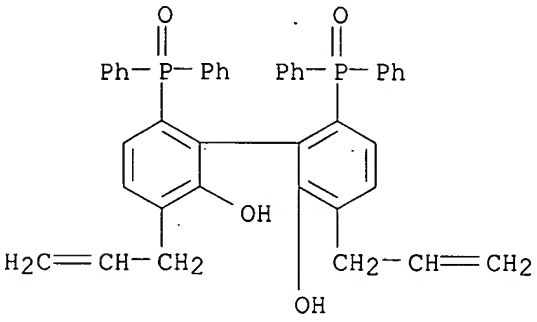
IT 844679-25-0P 844679-26-1P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation of allyloxybiphenyl phosphorus ligands for transition metal catalyzed enantioselective catalysis)
RN 844679-25-0 CAPLUS
CN Phosphine oxide, [(1R)-6,6'-bis(2-propenyloxy)[1,1'-biphenyl]-2,2'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



RN 844679-26-1 CAPLUS
CN [1,1'-Biphenyl]-2,2'-diol, 6,6'-bis(diphenylphosphinyl)-3,3'-di-2-propenyl-, (1R)- (9CI) (CA INDEX NAME)



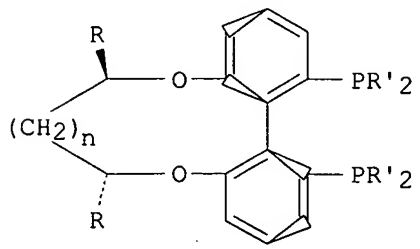
IT 844450-47-1P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of allyloxybiphenyl phosphorus ligands for transition metal catalyzed enantioselective catalysis)
RN 844450-47-1 CAPLUS
CN [1,1'-Biphenyl]-2,2'-diol, 6,6'-bis(diphenylphosphinyl)-3,3'-di-2-propenyl- (9CI) (CA INDEX NAME)



L3 ANSWER 13 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2005:58129 CAPLUS
DOCUMENT NUMBER: 142:137081
TITLE: Preparation of biphenyldiphosphine compounds useful in asymmetric reactions
INVENTOR(S): Chan, Albert Sun-chi; Qiu, Liqin
PATENT ASSIGNEE(S): The Hong Kong Polytechnic University, Hong Kong
SOURCE: U.S. Pat. Appl. Publ., 18 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
US 20050014633	A1	20050120	US 2004-888820		20040709
US 7094725	B2	20060822			
PRIORITY APPLN. INFO.:			US 2003-486496P	P	20030711

OTHER SOURCE(S): MARPAT 142:137081
GI



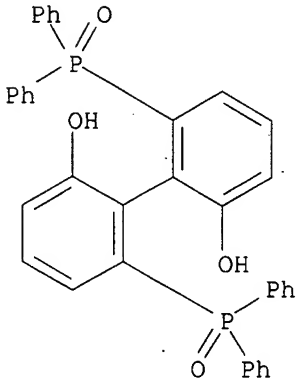
I

AB The present invention provides compds. of the formula I wherein R = optionally substituted lower alkyl, cycloalkyl or aryl; R' = alkyl or aryl; n = 0, 1, or 2; or an enantiomer thereof; or an enantiomeric mixture thereof. The compds. of formula I are bridged C2-sym. biphenyldiphosphine analogs and, thus, may be employed as ligands to generate chiral transition metal catalysts which may be applied in a variety of asym. reactions. The compds. of the present invention are easily accessible in

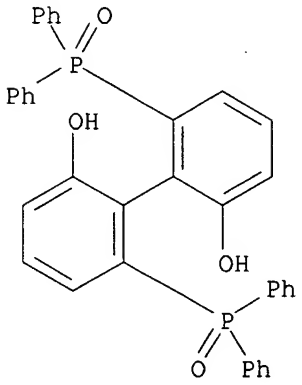
high diastereomeric and optical purity according to the methods disclosed herein.

IT 524711-75-9P 679422-50-5P
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(preparation of biphenyldiphosphine compds. useful in asym. reactions)

RN 524711-75-9 CAPLUS
CN [1,1'-Biphenyl]-2,2'-diol, 6,6'-bis(diphenylphosphinyl)-, (1R)- (9CI) (CA INDEX NAME)

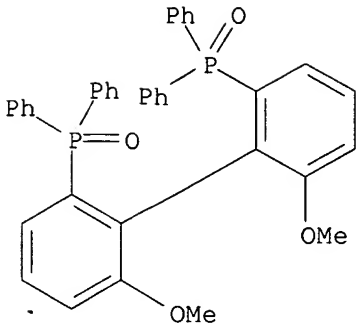


RN 679422-50-5 CAPLUS
CN [1,1'-Biphenyl]-2,2'-diol, 6,6'-bis(diphenylphosphinyl)-, (1S)- (9CI) (CA INDEX NAME)

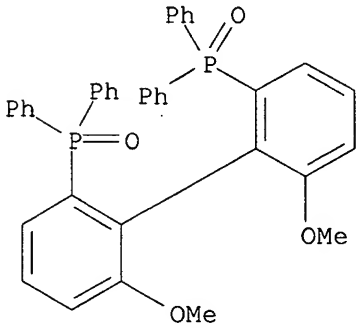


IT 133577-82-9 133577-84-1
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of biphenyldiphosphine compds. useful in asym. reactions)

RN 133577-82-9 CAPLUS
CN Phosphine oxide, 1,1'-[(1R)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-diphenyl- (CA INDEX NAME)



RN 133577-84-1 CAPLUS
CN Phosphine oxide, 1,1'-[(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-diphenyl- (CA INDEX NAME)



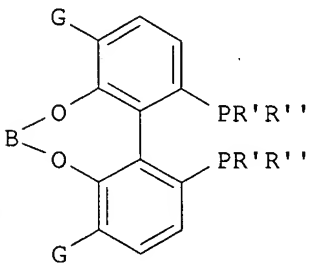
L3 ANSWER 14 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2004:1127391 CAPLUS
DOCUMENT NUMBER: 142:56522
TITLE: Chiral ligands for application in asymmetric syntheses
INVENTOR(S): Meseguer, Benjamin; Arlt, Dieter
PATENT ASSIGNEE(S): Bayer Chemicals Ag, Germany
SOURCE: PCT Int. Appl., 28 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004111063	A2	20041223	WO 2004-EP5930	20040602
WO 2004111063	A3	20050331		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
DE 10327109	A1	20041230	DE 2003-10327109	20030613
DE 10337013	A1	20050331	DE 2003-10337013	20030812

EP 1636243	A2	20060322	EP 2004-739512		20040602
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, PL, SK					
JP 2006527221	T	20061130	JP 2006-515817		20040602
US 20060161022	A1	20060720	US 2005-298641		20051208
US 20070004927	A1	20070104	US 2006-571722		20060313
PRIORITY APPLN. INFO.:			DE 2003-10327109	A	20030613
			DE 2003-10337013	A	20030812
			WO 2004-EP5930	W	20040602

OTHER SOURCE(S): CASREACT 142:56522; MARPAT 142:56522

GI



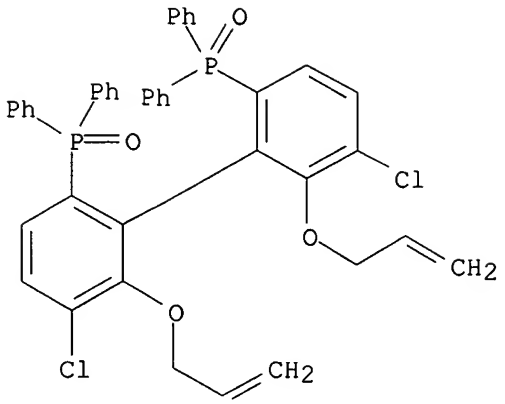
I

AB The invention relates to the preparation of biarylbisphosphines I (B = (CHR1)n(R2C:CR3)(CHR4)m, R1-R4 = H, alkyl, n, m = 1-8; G = Cl, H; R', R'' = aryl, alkyl) and intermediates thereof. Furthermore, the invention relates to catalysts produced from the biarylbisphosphines and the use thereof in asym. syntheses. Thus, reaction of (S)-[5,5'-dichloro-6,6'-dihydroxybiphenyl-2,2'-diyl]bis(diphenylphosphine oxide) with allyl chloride in DMF in the presence of K2CO3 gave (S)-[5,5'-dichloro-6,6'-(1,4-but-2-enedioxy)biphenyl-2,2'-diyl]bis(diphenylphosphine oxide) as cocatalyst for ruthenium catalyzed enantioselective hydrogenation.

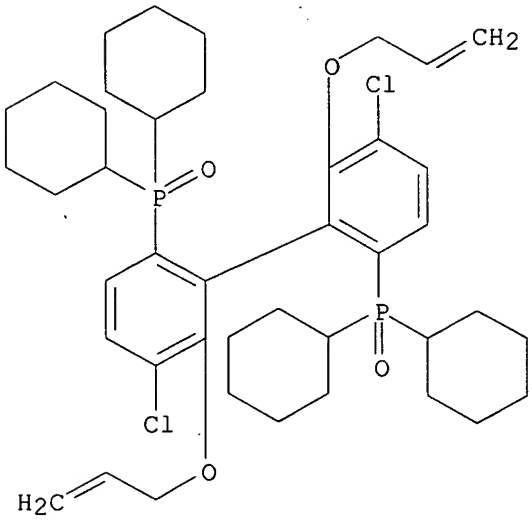
IT 810674-60-3P 810674-92-1P 810674-93-2P
810674-94-3P 810674-95-4P 810674-96-5P
810674-97-6P 810674-98-7P 810674-99-8P
810675-00-4P 810675-01-5P 810675-02-6P
810675-03-7P 810675-19-5P
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(preparation of biarylbisphosphines as chiral ligands for ruthenium complex catalyzed enantioselective hydrogenation or in asym. synthesis)

RN 810674-60-3 CAPLUS

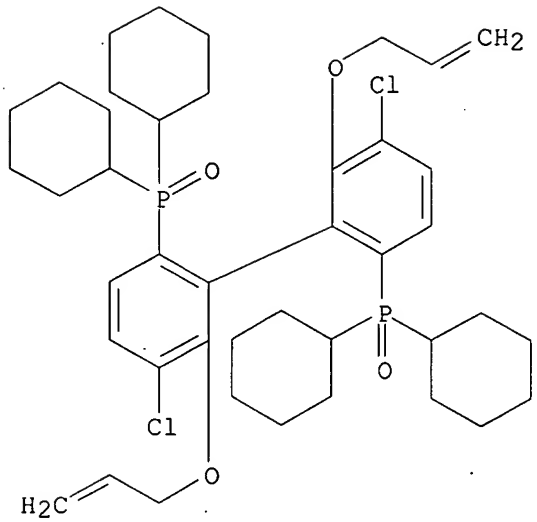
CN Phosphine oxide, [(1S)-5,5'-dichloro-6,6'-bis(2-propenyloxy)[1,1'-biphenyl]-2,2'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



RN 810674-92-1 CAPLUS
CN Phosphine oxide, [(1R)-5,5'-dichloro-6,6'-bis(2-propenyloxy)[1,1'-biphenyl]-2,2'-diyl]bis[dicyclohexyl- (9CI) (CA INDEX NAME)

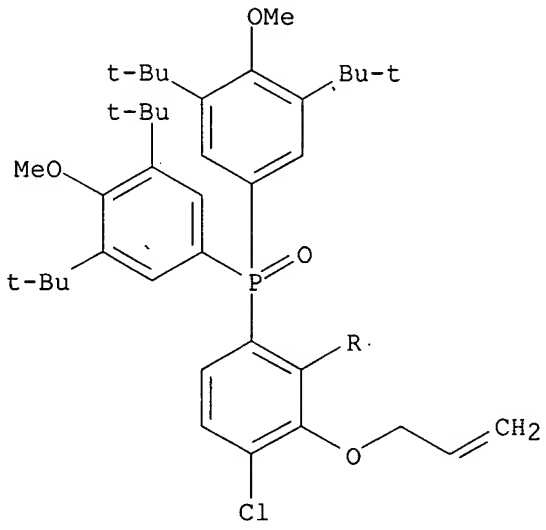


RN 810674-93-2 CAPLUS
CN Phosphine oxide, [(1S)-5,5'-dichloro-6,6'-bis(2-propenyloxy)[1,1'-biphenyl]-2,2'-diyl]bis[dicyclohexyl- (9CI) (CA INDEX NAME)



RN 810674-94-3 CAPLUS
CN Phosphine oxide, [(1R)-5,5'-dichloro-6,6'-bis(2-propenyloxy)[1,1'-biphenyl]-2,2'-diyl]bis[bis[3,5-bis(1,1-dimethylethyl)-4-methoxyphenyl]-(9CI) (CA INDEX NAME)

PAGE 1-A



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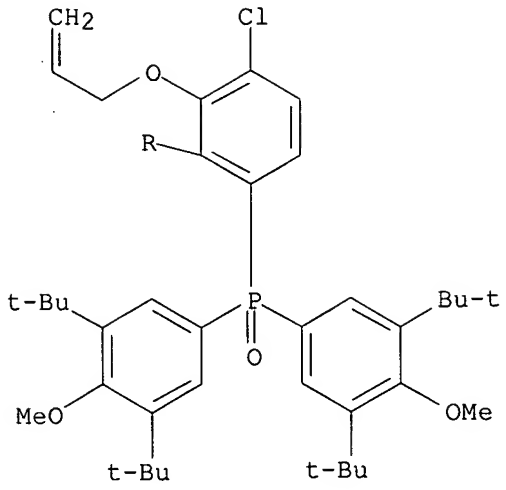

RN 810674-95-4 CAPLUS
CN Phosphine oxide, [(1S)-5,5'-dichloro-6,6'-bis(2-propenyloxy)[1,1'-biphenyl]-2,2'-diyl]bis[bis[3,5-bis(1,1-dimethylethyl)-4-methoxyphenyl]-(9CI) (CA INDEX NAME)

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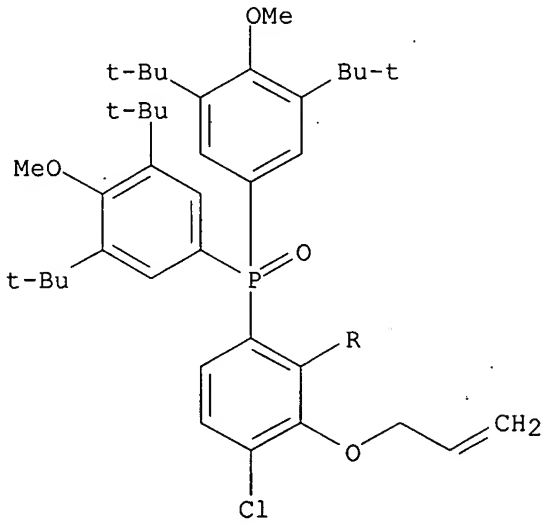

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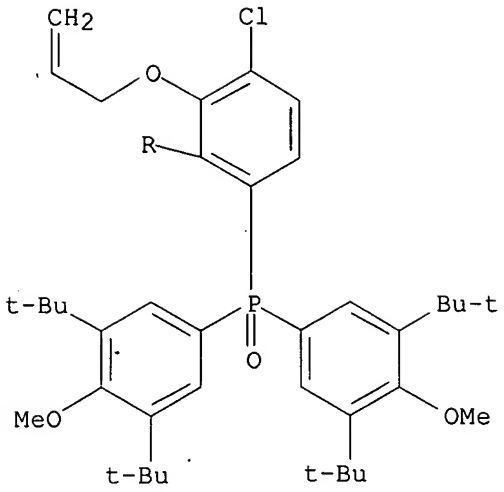
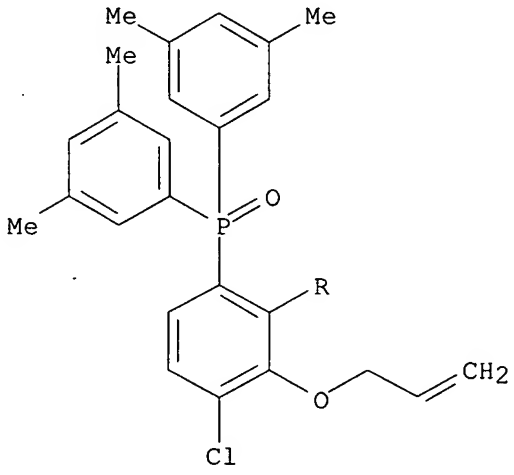


RN 810674-96-5 CAPLUS
CN Phosphine oxide, [(1R)-5,5'-dichloro-6,6'-bis(2-propenyloxy)[1,1'-biphenyl]-2,2'-diyl]bis[bis(3,5-dimethylphenyl)- (9CI) (CA INDEX NAME)

PAGE 1-A



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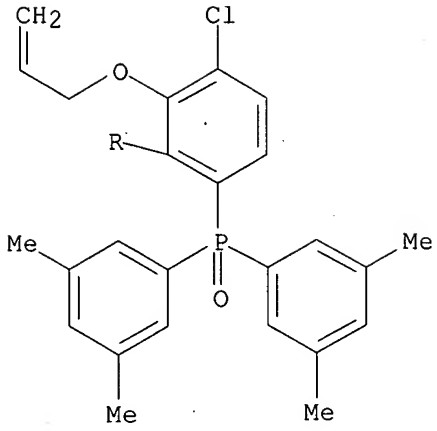
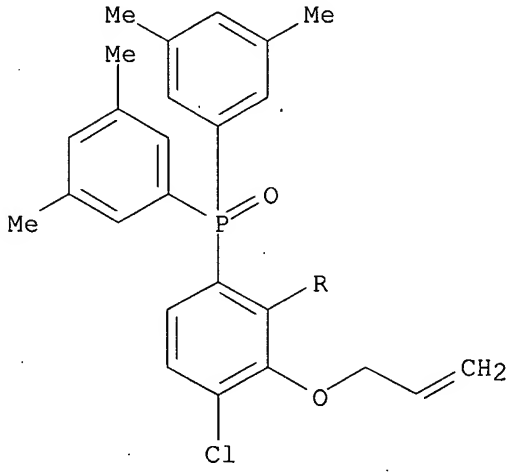


RN 810674-97-6 CAPLUS
CN Phosphine oxide, [(1S)-5,5'-dichloro-6,6'-bis(2-propenyloxy)[1,1'-biphenyl]-2,2'-diyl]bis[bis(3,5-dimethylphenyl)- (9CI) (CA INDEX NAME)

PAGE 1-A



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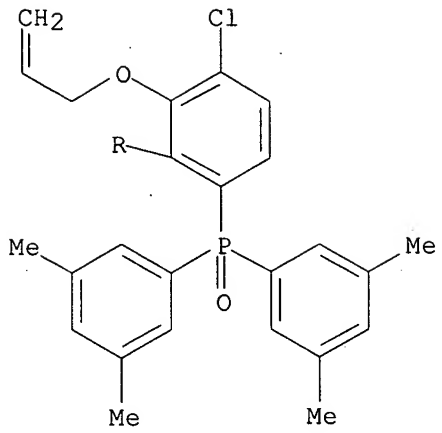
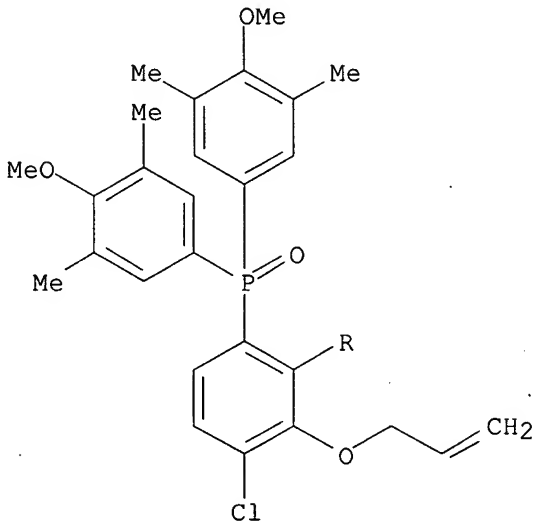


RN 810674-98-7 CAPLUS
CN Phosphine oxide, [(1R)-5,5'-dichloro-6,6'-bis(2-propenyloxy)[1,1'-biphenyl]-2,2'-diyl]bis[bis(4-methoxy-3,5-dimethylphenyl)- (9CI) (CA INDEX NAME)

PAGE 1-A



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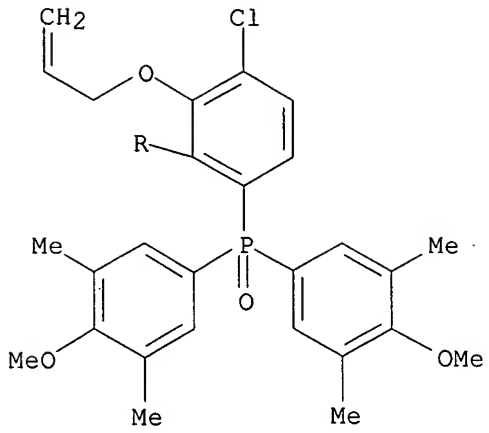
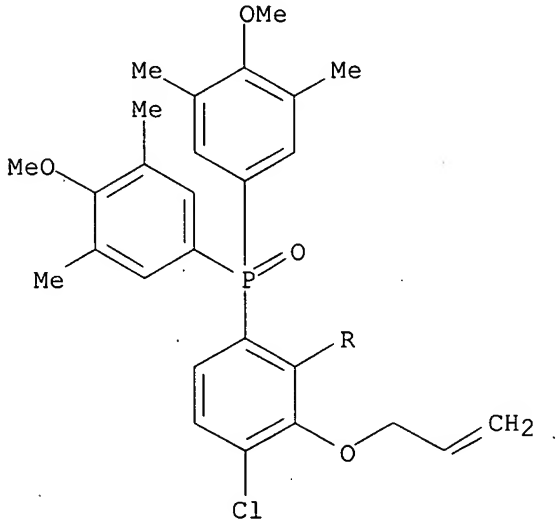


RN 810674-99-8 CAPLUS
CN Phosphine oxide, [(1S)-5,5'-dichloro-6,6'-bis(2-propenyloxy)[1,1'-biphenyl]-2,2'-diyl]bis[bis(4-methoxy-3,5-dimethylphenyl)- (9CI) (CA INDEX NAME)

PAGE 1-A



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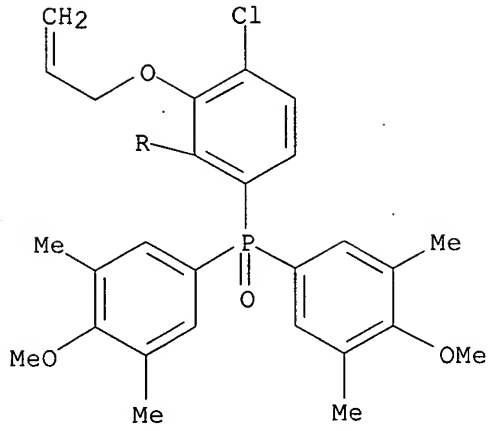
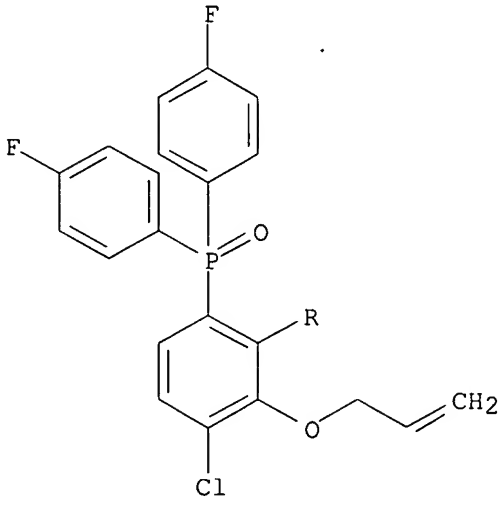


RN 810675-00-4 CAPLUS
CN Phosphine oxide, [(1R)-5,5'-dichloro-6,6'-bis(2-propenyloxy)[1,1'-biphenyl]-2,2'-diyl]bis[bis(4-fluorophenyl)- (9CI) (CA INDEX NAME)

PAGE 1-A



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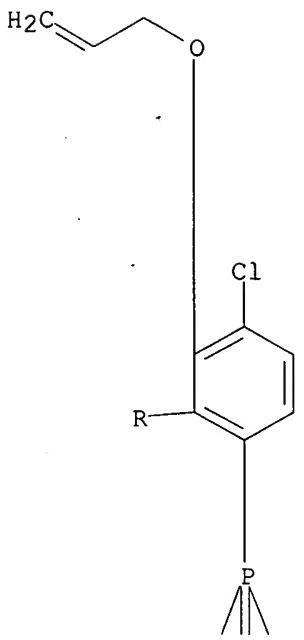

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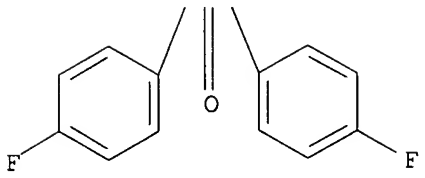
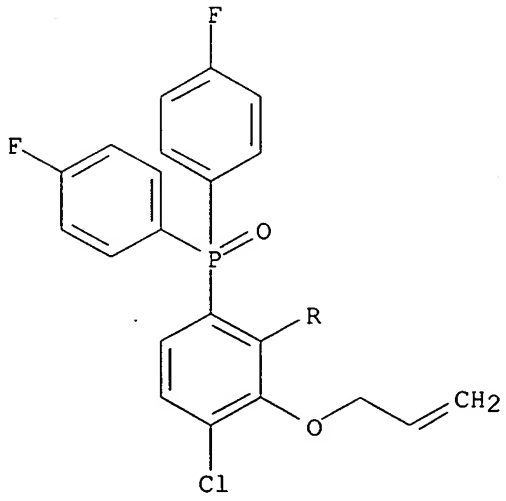


RN 810675-01-5 CAPLUS
CN Phosphine oxide, [(1S)-5,5'-dichloro-6,6'-bis(2-propenyloxy)[1,1'-biphenyl]-2,2'-diyl]bis[bis(4-fluorophenyl)- (9CI) (CA INDEX NAME)

PAGE 1-A



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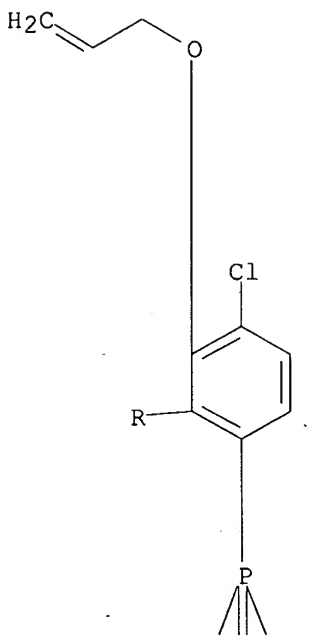

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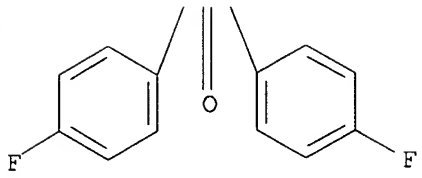
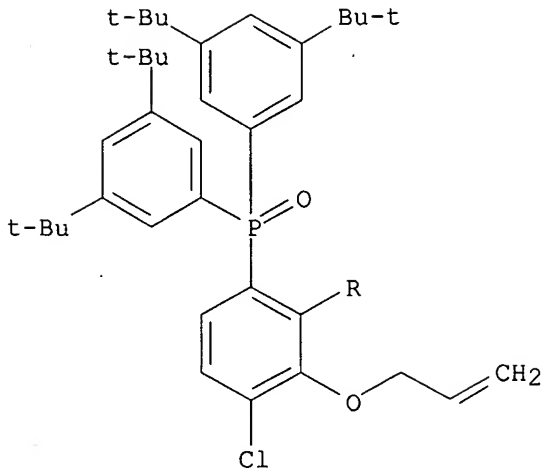


RN 810675-02-6 CAPLUS
CN Phosphine oxide, [(1R)-5,5'-dichloro-6,6'-bis(2-propenyloxy)[1,1'-biphenyl]-2,2'-diyl]bis[bis[3,5-bis(1,1-dimethylethyl)phenyl]- (9CI) (CA INDEX NAME)

PAGE 1-A



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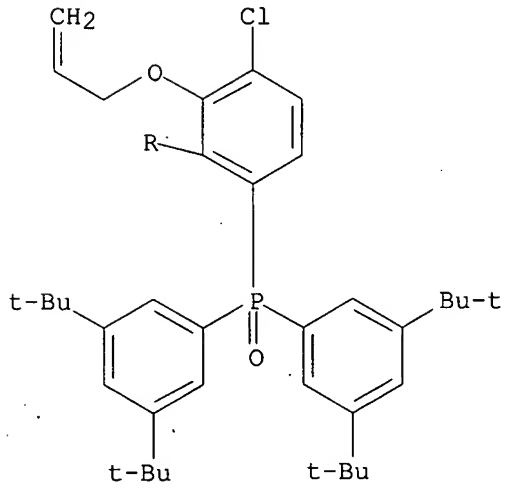
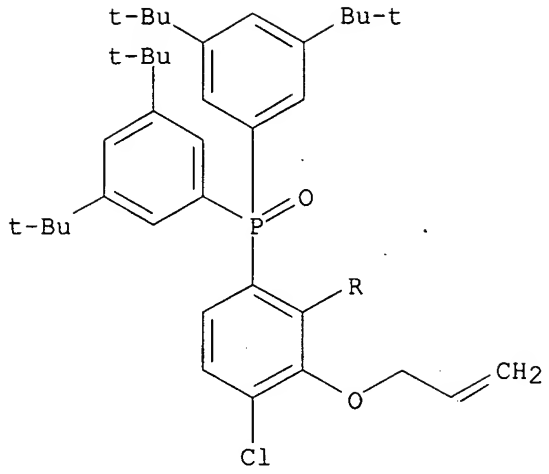


RN 810675-03-7 CAPLUS
CN Phosphine oxide, [(1S)-5,5'-dichloro-6,6'-bis(2-propenyloxy)[1,1'-biphenyl]-2,2'-diyl]bis[bis[3,5-bis(1,1-dimethylethyl)phenyl]- (9CI) (CA INDEX NAME)

PAGE 1-A



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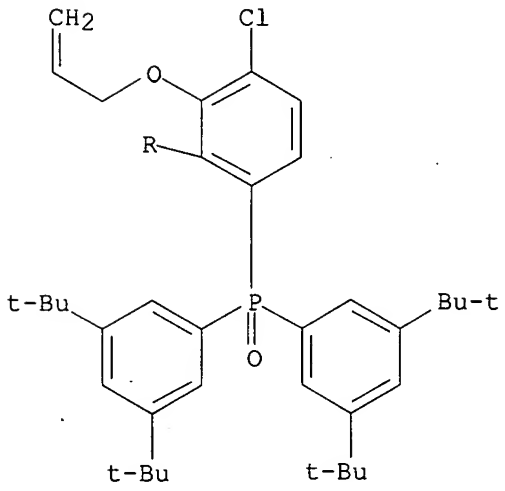
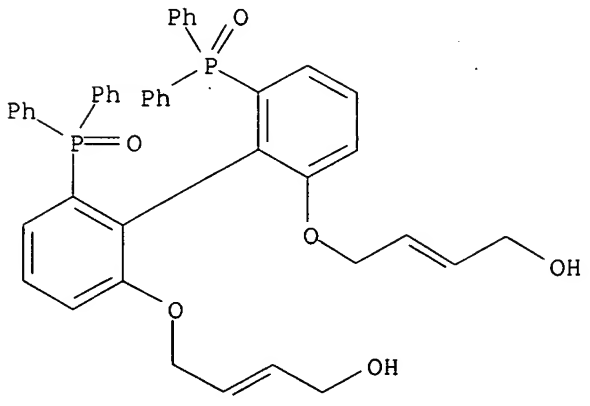
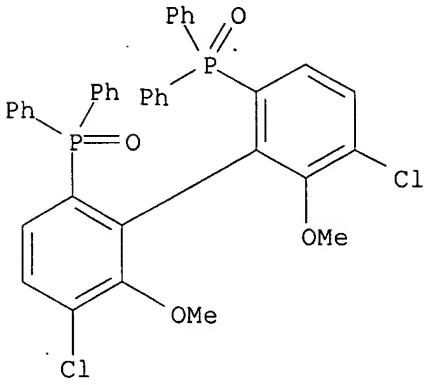


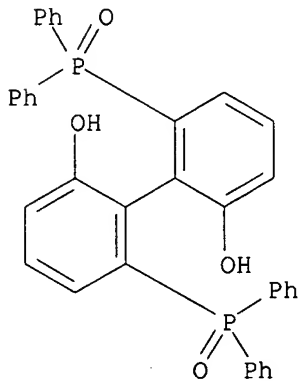
RN 810675-19-5 CAPLUS
CN 2-Buten-1-ol, 4,4'-[[(1R)-6,6'-bis(diphenylphosphinyl)[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis-, (2Z,2'Z)- (9CI) (CA INDEX NAME)



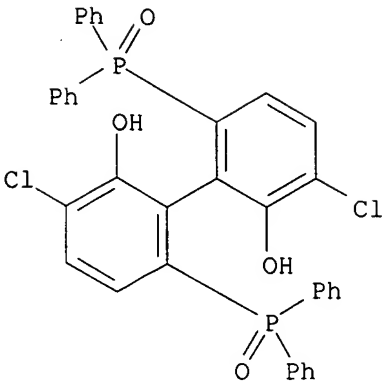
IT 185913-95-5 524711-75-9
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of biarylbisphosphines as chiral ligands for ruthenium complex catalyzed enantioselective hydrogenation or in asym. synthesis)
RN 185913-95-5 CAPLUS
CN Phosphine oxide, [(1S)-5,5'-dichloro-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



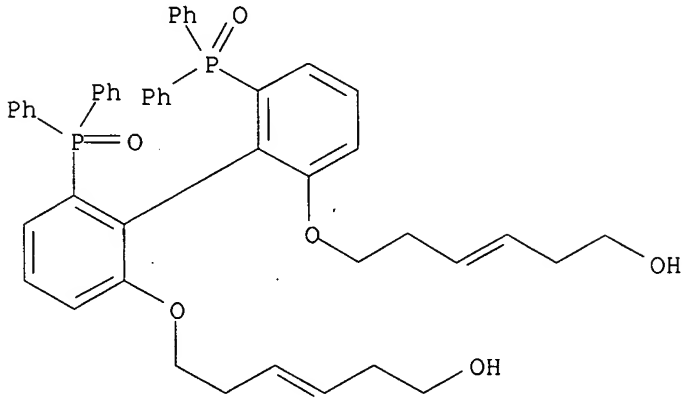
RN 524711-75-9 CAPLUS
CN [1,1'-Biphenyl]-2,2'-diol, 6,6'-bis(diphenylphosphinyl)-, (1R)- (9CI) (CA INDEX NAME)



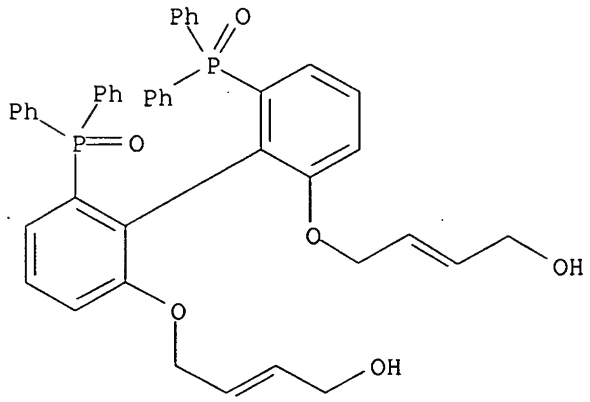
IT 691363-03-8P 810674-62-5P 810674-63-6P
810674-67-0P 810674-68-1P 810674-69-2P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation of biarylbisphosphines as chiral ligands for ruthenium complex catalyzed enantioselective hydrogenation or in asym. synthesis)
RN 691363-03-8 CAPLUS
CN [1,1'-Biphenyl]-2,2'-diol, 3,3'-dichloro-6,6'-bis(diphenylphosphinyl)-, (1S)- (9CI) (CA INDEX NAME)



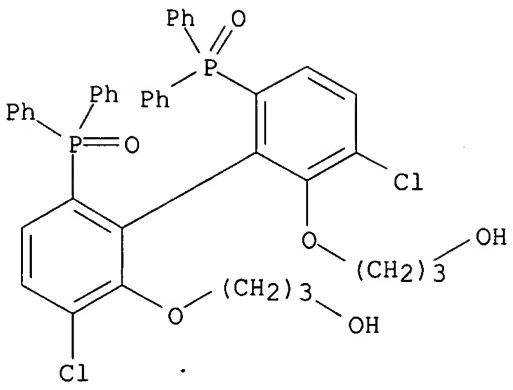
RN 810674-62-5 CAPLUS
CN 3-Hexen-1-ol, 6,6'-[[(1S)-6,6'-bis(diphenylphosphinyl)[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis-, (3Z,3'Z)- (9CI) (CA INDEX NAME)



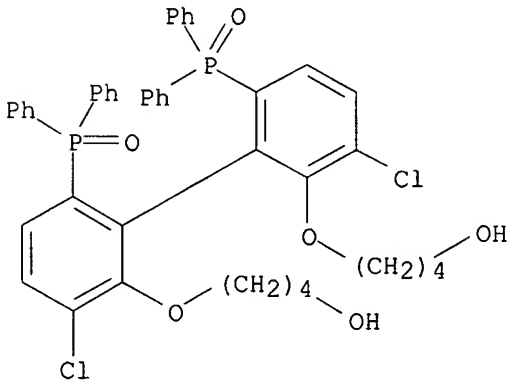
RN 810674-63-6 CAPLUS
CN 2-Buten-1-ol, 4,4'-[[(1R)-6,6'-bis(diphenylphosphinyl)[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis-, (2E,2'E)- (9CI) (CA INDEX NAME)



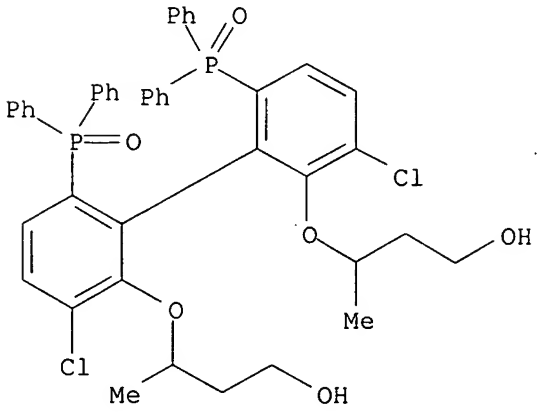
RN 810674-67-0 CAPLUS
CN 1-Propanol, 3,3'-[[(1S)-3,3'-dichloro-6,6'-bis(diphenylphosphinyl)[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis- (9CI) (CA INDEX NAME)



RN 810674-68-1 CAPLUS
CN 1-Butanol, 4,4'-[[(1S)-3,3'-dichloro-6,6'-bis(diphenylphosphinyl)[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis- (9CI) (CA INDEX NAME)



RN 810674-69-2 CAPLUS
CN 1-Butanol, 3,3'-[[(1S)-3,3'-dichloro-6,6'-bis(diphenylphosphinyl)[1,1'-biphenyl]-2,2'-diyl]bis(oxy)]bis- (9CI) (CA INDEX NAME)



L3 ANSWER 15 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2004:308392 CAPLUS
DOCUMENT NUMBER: 140:321522

TITLE: Isomerization of chiral homogeneous o,o'-dihydroxybiphenyl derivatives

INVENTOR(S): Arlt, Dieter

PATENT ASSIGNEE(S): Germany

SOURCE: PCT Int. Appl., 26 pp.
CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: German

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004031110	A2	20040415	WO 2003-EP10764	20030927
WO 2004031110	A3	20040610		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
DE 10324878	A1	20040422	DE 2003-10324878	20030602
AU 2003273926	A1	20040423	AU 2003-273926	20030927

PRIORITY APPLN. INFO.:

DE 2002-10246137	A	20021001
DE 2003-10324878	A	20030602
WO 2003-EP10764	W	20030927

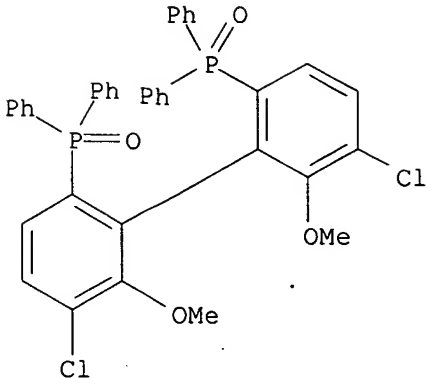
OTHER SOURCE(S): CASREACT 140:321522; MARPAT 140:321522

AB Chiral homogeneous o,o'-dihydroxybiphenyl derivs., which either act as bisphosphine ligands of enantioselective transition metal complex catalysts (no data), or are used as intermediate products for producing ligands of this type, can be isomerized by thermal treatment, optionally in the presence of substances with an alkaline action, to produce a mixture of both enantiomers. The inventive method permits the targeted production of a ligand for enantioselective transition metal complex catalysts in (R)- or (S)- form, enabling the undesired enantiomer to be used. Thus, reaction of (R)-(6,6'-dihydroxybiphenyl-2,2'-diyl)bis(diphenylphosphine) with BuLi in ethylene glycol/hexane followed by heating the solution at 160° for 24h and HCl hydrolysis gave a mixture of (R)- and (S)-(6,6'-dihydroxybiphenyl-2,2'-diyl)bis(diphenylphosphine).

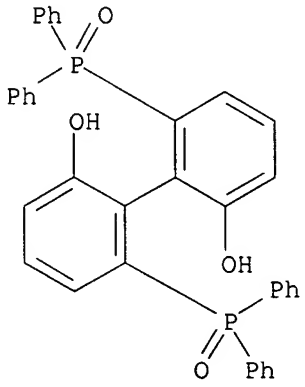
IT 185913-95-5P 524711-75-9P 679422-50-5P
691363-03-8P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(isomerization of chiral homogeneous dihydroxybiphenyl phosphine derivs.)

RN 185913-95-5 CAPLUS

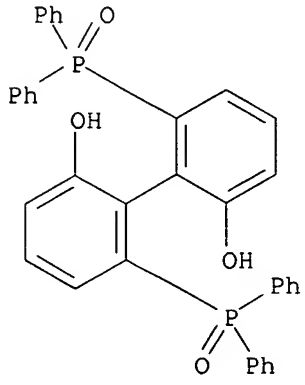
CN Phosphine oxide, [(1S)-5,5'-dichloro-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



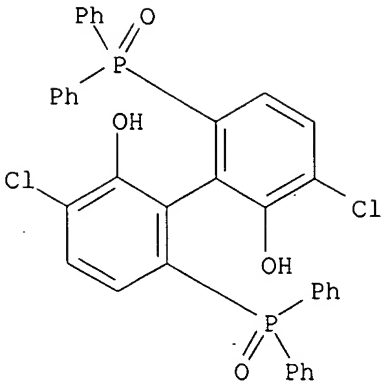
RN 524711-75-9 CAPLUS
CN [1,1'-Biphenyl]-2,2'-diol, 6,6'-bis(diphenylphosphinyl)-, (1R)- (9CI) (CA INDEX NAME)



RN 679422-50-5 CAPLUS
CN [1,1'-Biphenyl]-2,2'-diol, 6,6'-bis(diphenylphosphinyl)-, (1S)- (9CI) (CA INDEX NAME)

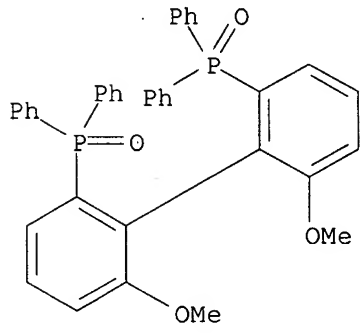


RN 691363-03-8 CAPLUS
CN [1,1'-Biphenyl]-2,2'-diol, 3,3'-dichloro-6,6'-bis(diphenylphosphinyl)-, (1S)- (9CI) (CA INDEX NAME)

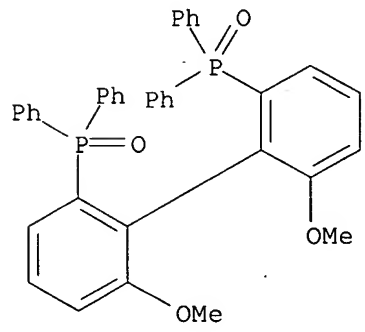


IT 133577-82-9P 133577-84-1P 185913-96-6P
679002-66-5P 679002-68-7P 688359-26-4P
691363-04-9P
RL: SPN (Synthetic preparation); PREP (Preparation)
(isomerization of chiral homogeneous dihydroxybiphenyl phosphine derivs.)

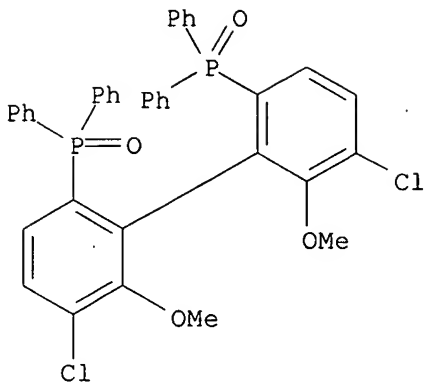
RN 133577-82-9 CAPLUS
CN Phosphine oxide, 1,1'-[(1R)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-diphenyl- (CA INDEX NAME)



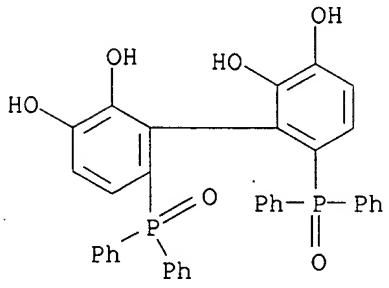
RN 133577-84-1 CAPLUS
CN Phosphine oxide, 1,1'-[(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-diphenyl- (CA INDEX NAME)



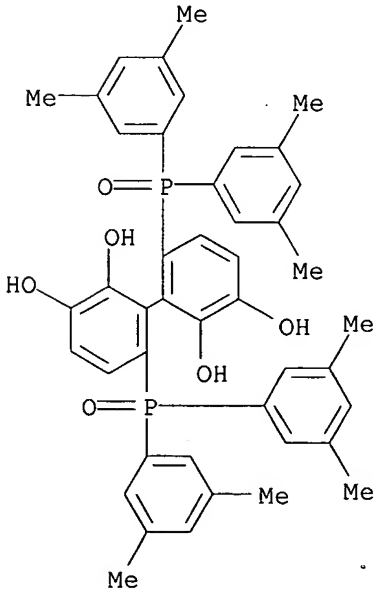
RN 185913-96-6 CAPLUS
CN Phosphine oxide, [(1R)-5,5'-dichloro-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



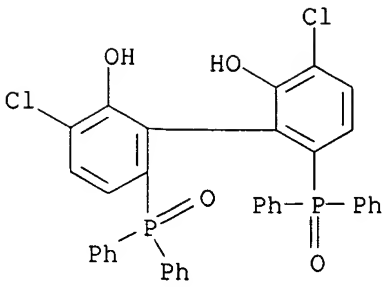
RN 679002-66-5 CAPLUS
CN [1,1'-Biphenyl]-2,2',3,3'-tetrol, 6,6'-bis(diphenylphosphinyl)- (CA INDEX NAME)



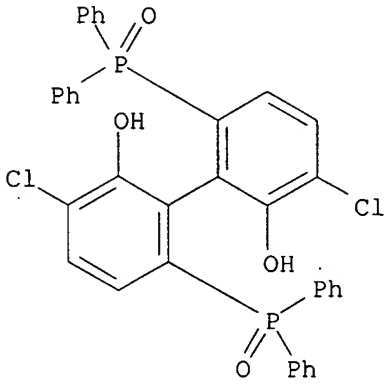
RN 679002-68-7 CAPLUS
CN [1,1'-Biphenyl]-2,2',3,3'-tetrol, 6,6'-bis[bis(3,5-dimethylphenyl)phosphinyl]- (CA INDEX NAME)



RN 688359-26-4 CAPLUS
CN [1,1'-Biphenyl]-2,2'-diol, 3,3'-dichloro-6,6'-bis(diphenylphosphinyl)- (CA INDEX NAME)



RN 691363-04-9 CAPLUS
CN [1,1'-Biphenyl]-2,2'-diol, 3,3'-dichloro-6,6'-bis(diphenylphosphinyl)-, (1R)- (9CI) (CA INDEX NAME)

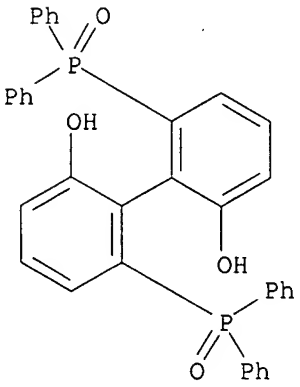


L3 ANSWER 16 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2002:980764 CAPLUS
DOCUMENT NUMBER: 138:376639
TITLE: (R)-(6,6'-Dihydroxybiphenyl-2,2'-diyl)bis(diphenylphosphine oxide) methanol solvate
AUTHOR(S): Qiu, Li Qin; Qi, Jian Ying; Ji, Jian Xin; Zhou, Zhong Yuan; Yeung, Chi Hung; Choi, Michael C. K.; Chan, Albert S. C.
CORPORATE SOURCE: Open Laboratory of Chirotechnology of the Institute of Molecular Technology for Drug Discovery and Synthesis and Department of Applied Biology and Chemical Technology, Hong Kong Polytechnic University, Hong Kong, Peop. Rep. China
SOURCE: Acta Crystallographica, Section C: Crystal Structure Communications (2003), C59(1), o33-o35
CODEN: ACSCEE; ISSN: 0108-2701
PUBLISHER: Blackwell Munksgaard
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The title compound, $C_{36}H_{28}O_4P_2 \cdot CH_4O$, was synthesized directly from the methoxy analog. The crystal structure shows that one OH group interacts with an O atom of a phosphine oxide group in an adjacent mol., while the other OH group complexes with the MeOH solvent mol. via intermol. H bonds. An O atom of one phosphine oxide group interacts with the hydroxy H atom of MeOH via a H bond. There are intra- and intermol. π-π interactions between the Ph rings. All these interactions gave supramol. chiral parallelogram channels via self-assembly. Crystallog. data are given.
IT 524711-76-0P, (R)-(6,6'-Dihydroxybiphenyl-2,2'-

diyl)bis(diphenylphosphine oxide) methanol solvate (1:1)
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(crystal structure of)
RN 524711-76-0 CAPLUS
CN [1,1'-Biphenyl]-2,2'-diol, 6,6'-bis(diphenylphosphinyl)-, (1R)-, compd. with methanol (1:1) (9CI) (CA INDEX NAME)

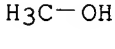
CM 1

CRN 524711-75-9
CMF C36 H28 O4 P2

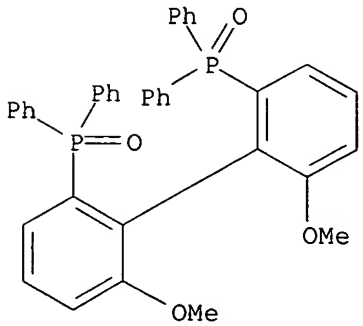


CM 2

CRN 67-56-1
CMF C H4 O



IT 133577-82-9, (R)-(6,6'-Dimethoxybiphenyl-2,2'-diyl)bis(diphenylphosphine oxide)
RL: RCT (Reactant); RACT (Reactant or reagent)
(demethoxylation using tribromoboron of)
RN 133577-82-9 CAPLUS
CN Phosphine oxide, 1,1'-[(1R)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-diphenyl- (CA INDEX NAME)



REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 17 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2002:364020 CAPLUS
DOCUMENT NUMBER: 136:369840
TITLE: Improved method for the preparation of enantiomerically pure (5,5'-dichloro-6,6'-dimethoxybiphenyl-2,2'-diyl)-bis-(diphenylphosphine oxide)
INVENTOR(S): Pohl, Torsten; Prinz, Thomas; Giffels, Guido; Sirges, Wolfgram
PATENT ASSIGNEE(S): Bayer Aktiengesellschaft, Germany
SOURCE: Eur. Pat. Appl., 12 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

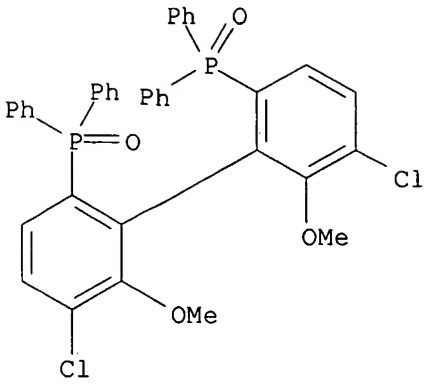
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1205486	A1	20020515	EP 2001-126101	20011102
EP 1205486	B1	20040211		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
DE 10056310	A1	20020516	DE 2000-10056310	20001114
AT 259371	T	20040215	AT 2001-126101	20011102
ES 2215835	T3	20041016	ES 2001-126101	20011102
JP 2002179693	A	20020626	JP 2001-343031	20011108
JP 3900254	B2	20070404		
US 20020058814	A1	20020516	US 2001-10176	20011113
US 6489513	B2	20021203		

PRIORITY APPLN. INFO.: DE 2000-10056310 A 20001114
OTHER SOURCE(S): CASREACT 136:369840

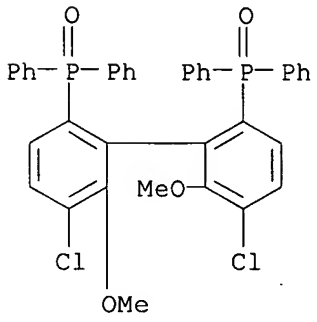
AB The preparation of title compound is described in four steps starting from 5-bromo-2-chloroanisole. Thus, phosphination of 5-bromo-2-chloroanisole with diphenylphosphinic chloride in presence of Mg in THF gave 82% (4-chloro-3-methoxyphenyl)diphenylphosphine oxide which on lithiation with LDA followed by iodination in THF gave 93.5% (4-chloro-2-iodo-3-methoxyphenyl)diphenylphosphine oxide. Copper-mediated coupling of (4-chloro-2-iodo-3-methoxyphenyl)diphenylphosphine oxide in PhMe followed by resolution with (+)-dibenzoyltartaric acid and reduction with HSiCl3 in xylene gave enantiomerically pure title compound, (5,5'-dichloro-6,6'-dimethoxybiphenyl-2,2'-diyl)-bis-(diphenylphosphine oxide).

IT 185913-96-6P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and reduction of)

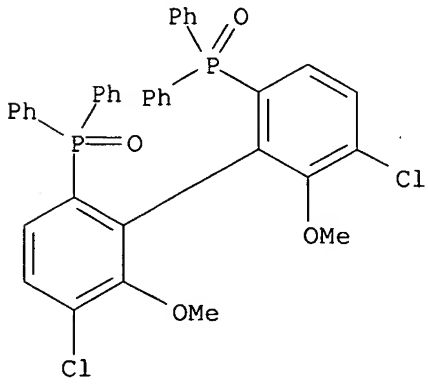
RN 185913-96-6 CAPLUS
CN Phosphine oxide, [(1R)-5,5'-dichloro-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



IT 185836-54-8P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and resolution with dibenzoyltartaric acid)
RN 185836-54-8 CAPLUS
CN Phosphine oxide, [3',5-dichloro-6'-(diphenylphosphinyl)-2',6-dimethoxy[1,1'-biphenyl]-2-yl]diphenyl- (CA INDEX NAME)

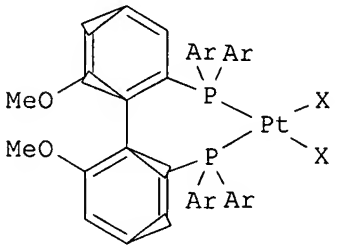


IT 185913-95-5P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of)
RN 185913-95-5 CAPLUS
CN Phosphine oxide, [(1S)-5,5'-dichloro-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 18 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2001:880027 CAPLUS
DOCUMENT NUMBER: 136:166979
TITLE: Disparate Roles of Chiral Ligands and Molecularly Imprinted Cavities in Asymmetric Catalysis and Chiral Poisoning
AUTHOR(S): Koh, Jeong Hwan; Larsen, Andrew O.; White, Peter S.; Gagne, Michel R.
CORPORATE SOURCE: Department of Chemistry, University of North Carolina, Chapel Hill, NC, 27599-3290, USA
SOURCE: Organometallics (2002), 21(1), 7-9
CODEN: ORGND7; ISSN: 0276-7333
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 136:166979
GI



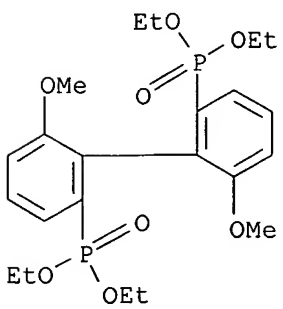
I

AB The activation of molecularly imprinted metal complexes generated Lewis acid catalysts, prepared via copolymn. of metallomonomers (I; X = Cl, X2 = O,O-dideprotonated (S)-, (R)-BINOL; Ar = p-C6H4C(CH3):CH2) with EDMA (ethylene dimethacrylate), for the ene reaction, each of which contains a chiral diphosphine ligand and a chiral BINOL-shaped cavity. Poisoning expts. with (R)- and (S)-BINAM (where (R)- and (S)-BINAM = (R)- and (S)-1,1'-binaphthyl-2,2'-diamine, resp.) indicated that while the chiral cavity can differentiate the chiral poisons, it is the chiral diphosphine ligand which controls the enantioselectivity of the ene product.

IT 145265-38-9
RL: RCT (Reactant); RACT (Reactant or reagent)
(lithium aluminum hydride reduction of)

RN 145265-38-9 CAPLUS

CN Phosphonic acid, P,P'-[(1S)-2',6-dimethoxy[1,1'-biphenyl]-2,6'-diyl]bis-, P,P,P',P'-tetraethyl ester (CA INDEX NAME)

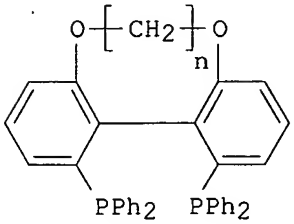


REFERENCE COUNT: 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 19 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2001:228894 CAPLUS
DOCUMENT NUMBER: 134:266437
TITLE: Chiral phosphines, transition metal complexes thereof and uses thereof in asymmetric reactions
INVENTOR(S): Zhang, Xumu
PATENT ASSIGNEE(S): Penn State Research Foundation, USA
SOURCE: PCT Int. Appl., 52 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001021625	A1	20010329	WO 2000-US25635	20000919
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
CA 2385421	A1	20010329	CA 2000-2385421	20000919
EP 1214328	A1	20020619	EP 2000-965136	20000919
EP 1214328	B1	20060503		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL				
US 6521769	B1	20030218	US 2000-665456	20000919
JP 2003509513	T	20030311	JP 2001-525000	20000919
AT 324943	T	20060615	AT 2000-965136	20000919
ES 2263487	T3	20061216	ES 2000-965136	20000919

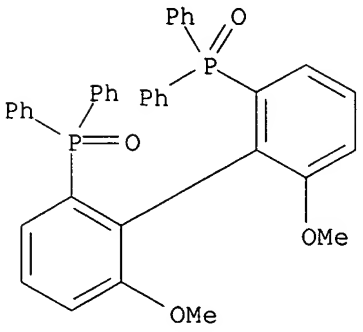
PRIORITY APPLN. INFO.: US 1999-154845P P 19990920
WO 2000-US25635 W 20000919
OTHER SOURCE(S): CASREACT 134:266437; MARPAT 134:266437
GI



I

AB Chiral ligands and transition metal complexes based on such chiral ligands useful in asym. catalysis are disclosed. The chiral ligands include chiral C1-C6-TunaPhos ligands I (n = 1-6). The ruthenium TunaPhos complex reduces ketones to the corresponding alcs. with 95-99.6 % enantioselectivity. The transition metal complexes of the chiral ligands are useful in asym. reactions such as asym. hydrogenation, hydride transfer, hydrosilylation, hydroboration, hydrovinylation, hydroformylation, hydrocarboxylation, isomerization, allylic alkylation, cyclopropanation, Diels-Alder reaction, Heck reaction, isomerization,

Aldol reaction, Michael addition and epoxidn. reactions.
IT 133577-82-9, (R)-(6,6'-Dimethoxybiphenyl-2,2'-diyl)bis(diphenylphosphine oxide)
RL: RCT (Reactant); RACT (Reactant or reagent)
(reduction of)
RN 133577-82-9 CAPLUS
CN Phosphine oxide, 1,1'-[(1R)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-diphenyl- (CA INDEX NAME)

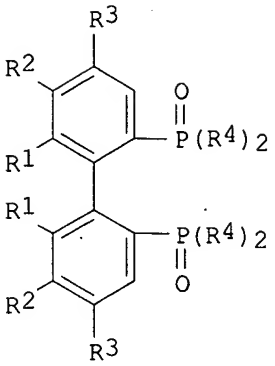


REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 20 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2001:28618 CAPLUS
DOCUMENT NUMBER: 134:86384
TITLE: Process for the racemization of atropisomeric bis(phosphine oxide) compounds
INVENTOR(S): Kienzle, Frank; Lalonde, Michel; Schmid, Rudolf; Wang, Shaoning
PATENT ASSIGNEE(S): F. Hoffmann-La Roche A.-G., Switz.
SOURCE: Eur. Pat. Appl., 12 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1067133	A1	20010110	EP 2000-114219	20000703
EP 1067133	B1	20030917		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
US 6288280	B1	20010911	US 2000-594643	20000615
AT 250072	T	20031015	AT 2000-114219	20000703
ES 2204411	T3	20040501	ES 2000-114219	20000703
CA 2313338	A1	20010109	CA 2000-2313338	20000704
JP 2001039993	A	20010213	JP 2000-203499	20000705
JP 3688563	B2	20050831		
IN 2000MA00517	A	20070420	IN 2000-MA517	20000705
CN 1281860	A	20010131	CN 2000-120417	20000707
BR 2000002650	A	20010313	BR 2000-2650	20000707
MX 2000PA06740	A	20050414	MX 2000-PA6740	20000707

PRIORITY APPLN. INFO.: EP 1999-113306 A 19990709
OTHER SOURCE(S): MARPAT 134:86384
GI



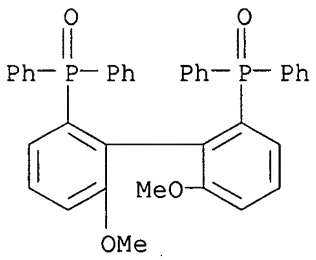
I

AB The present invention is concerned with a novel process for the racemization of atropisomeric bis(phosphine oxide) compds. I (R1 = C1-8 alkoxy, R2 = H, C1-8 alkyl, C1-8 alkoxy, R1R2 = methylenedioxy, ethylenedioxy; R3 = H, C1-8 alkyl, C1-8 alkoxy; R4 = (un)substituted Ph) in their (S) or (R) or non-racemic form, for the preparation of optical active bisphosphine ligands, which form optical active complexes with transition metals are formed. These complexes are used as catalysts in a number of asym. reactions. The racemization is thermal and carried out in high or low boiling solvent, under normal or elevated pressure at 105 to 3.5x107 Pa. The heating is performed in a system which allows heating up to 400° (reactor, autoclave, aluminum block, round-bottom flask with heating/stirring mantle and the like) or by microwave irradiation or in the melt at a temperature from 260-400°, preferably from 280-380°, batchwise or in a continuous manner.

IT 133545-15-0P, (RS)-MeOBIPHEPO 133545-18-3P, (RS)-DiMeOBIPHEPO 133545-23-0P, (RS)-p-Tol-MeOBIPHEPO
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of)

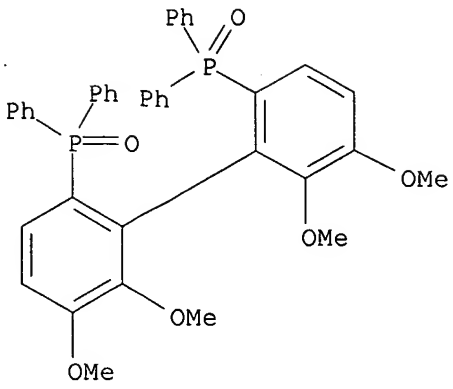
RN 133545-15-0 CAPLUS

CN Phosphine oxide, 1,1'-(6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[1,1-diphenyl- (CA INDEX NAME)



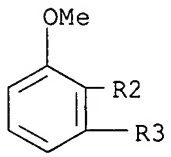
RN 133545-18-3 CAPLUS

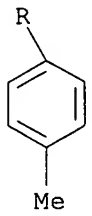
CN Phosphine oxide, (5,5',6,6'-tetramethoxy[1,1'-biphenyl]-2,2'-diyl)bis[diphenyl- (9CI) (CA INDEX NAME)



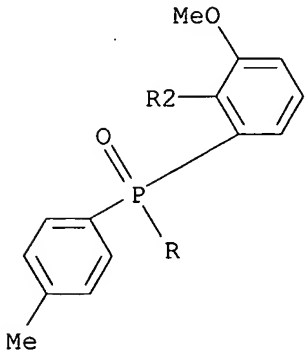
RN 133545-23-0 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis(4-methylphenyl)- (9CI) (CA INDEX NAME)

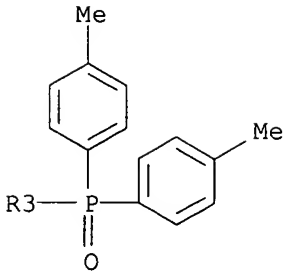
PAGE 1-A





PAGE 2-A

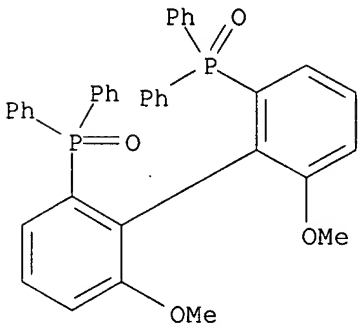




IT 133577-82-9, (R)-MeOBIPHEPO 133577-84-1, (S)-MeOBIPHEPO
133577-86-3, (S)-DiMeOBIPHEPO 133577-87-4,
(R)-DiMeOBIPHEPO 133577-89-6, (S)-p-Tol-MeOBIPHEPO
RL: RCT (Reactant); RACT (Reactant or reagent)
(thermal or microwave irradiation racemization of)

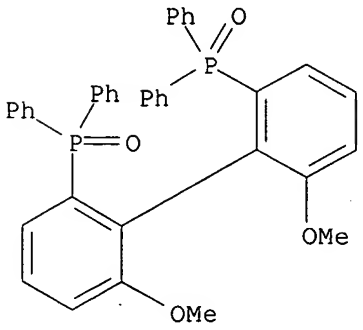
RN 133577-82-9 CAPLUS

CN Phosphine oxide, 1,1'-[(1R)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-diphenyl- (CA INDEX NAME)



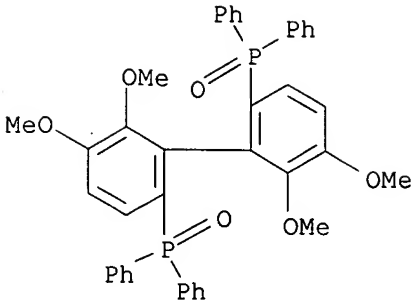
RN 133577-84-1 CAPLUS

CN Phosphine oxide, 1,1'-[(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-diphenyl- (CA INDEX NAME)

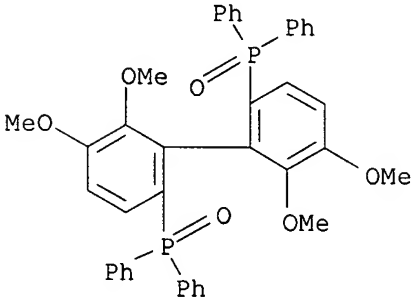


RN 133577-86-3 CAPLUS

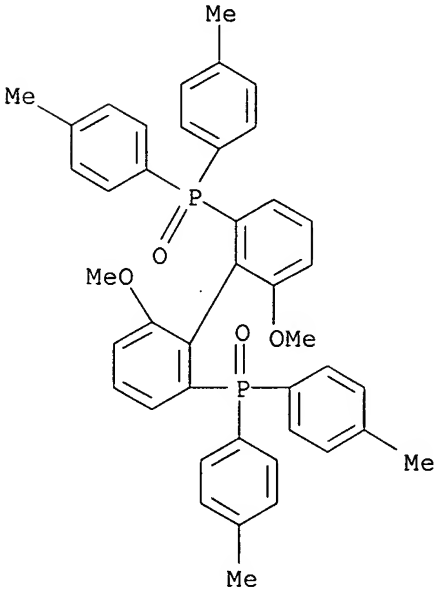
CN Phosphine oxide, [(1S)-5,5',6,6'-tetramethoxy[1,1'-biphenyl]-2,2'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



RN 133577-87-4 CAPLUS
CN Phosphine oxide, [(1R)-5,5',6,6'-tetramethoxy[1,1'-biphenyl]-2,2'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



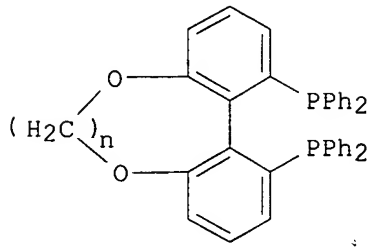
RN 133577-89-6 CAPLUS
CN Phosphine oxide, [(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[bis(4-methylphenyl)- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 21 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2000:574233 CAPLUS

DOCUMENT NUMBER: 133:309942
TITLE: Synthesis of Chiral Bisphosphines with Tunable Bite Angles and Their Applications in Asymmetric Hydrogenation of β-Ketoesters
AUTHOR(S): Zhang, Zhaoguo; Qian, Hu; Longmire, James; Zhang, Xumu
CORPORATE SOURCE: Department of Chemistry, The Pennsylvania State University, University Park, PA, 16802, USA
SOURCE: Journal of Organic Chemistry (2000), 65(19), 6223-6226
CODEN: JOCEAH; ISSN: 0022-3263
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 133:309942
GI



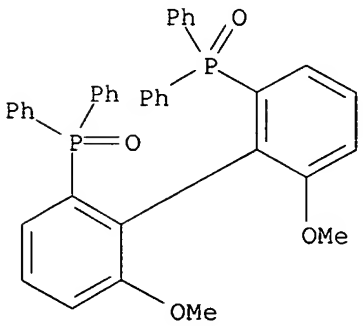
I

AB A series of chiral bisphosphines I (n = 1-6) with tunable dihedral angles were prepared for the first time and used for Ru-catalyzed asym. hydrogenation of β-ketoesters. Enantioselectivities with the Ru-I (n = 4) catalyst are comparable or better than those observed with Ru-BINAP and Ru-MeO-BIPHEP complexes, while enantioselectivities in asym. hydrogenation of β-ketoesters are low with other catalysts e.g., Ru-I (n = 1, 6). The current study demonstrates the concept that changes in ligand dihedral angles indeed cause significant variations of enantioselectivity.

IT 133577-82-9
RL: RCT (Reactant); RACT (Reactant or reagent)
(reduction of)

RN 133577-82-9 CAPLUS

CN Phosphine oxide, 1,1'-[(1R)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-diphenyl- (CA INDEX NAME)

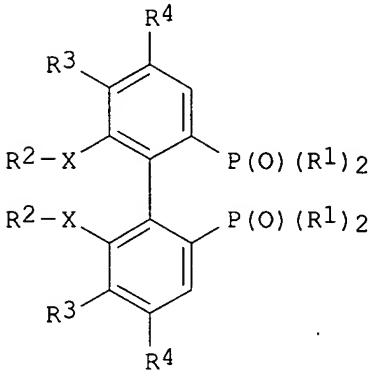


REFERENCE COUNT: 35 THERE ARE 35 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 22 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 2000:37891 CAPLUS
DOCUMENT NUMBER: 132:93468
TITLE: Preparation of biphenyl diphosphine oxide by lithiation and oxidative coupling of phenylphosphine oxide
INVENTOR(S): Yokozawa, Susumu; Saito, Takao; Sayo, Noboru; Ishizaki, Takeo
PATENT ASSIGNEE(S): Takasago Perfumery Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 14 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2000016997	A	20000118	JP 1998-181027	19980626
JP 3146187	B2	20010312		
PRIORITY APPLN. INFO.:			JP 1998-181027	19980626

OTHER SOURCE(S): CASREACT 132:93468; MARPAT 132:93468
GI



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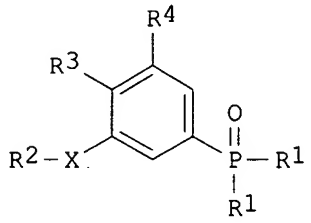
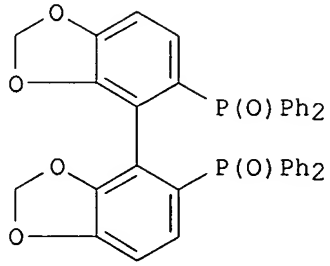


II



III

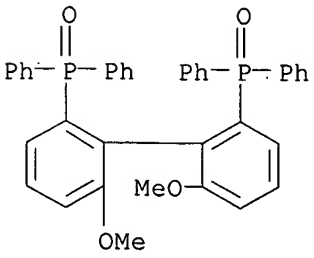
AB The title compds. [I; R1 = cycloalkyl, (un)substituted Ph, naphthyl, pyridyl, quinolyl, isoquinolyl, furfuryl, benzofurfuryl, thienyl, or benzothienyl; R2 = lower alkyl, lower ether, lower haloalkyl, Ph; X = hetero atom; R3, R4 = hydrogen, halogen, lower alkyl, lower alkoxy, di(lower alkyl)amino, lower haloalkyl, Ph; or R2 and R2 or R3 and R4 are linked to each other to form a ring] are prepared by treatment of phosphine oxide (II; R1 - R4, X = same as above) with base followed by dimerization using oxidizing agent. I are useful as intermediates for diphosphine compds. which are ligands of metal coordination compds. for an synthesis catalyst. Thus, a solution of 75.22 g diphenyl(3,4-

methylenedioxyphenyl)phosphine oxide in 300 mL THF was added dropwise at -10° to -5° to a solution of lithium diisopropylamide prepared by treatment of 40 mL diisopropylamine in THF with 175 mL 1.7 M BuLi solution and stirred at -12° for 15 min to give a lithium reagent which was added to 5.79 g FeCl3 in 150 mL toluene and 150 mL THF under ice-cooling at 8-10° over 30 min and stirred at room temperature overnight to give 74.8% biphenyl bisphosphine oxide (III).

IT 133545-15-0P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of biphenyl diphosphine oxide by lithiation and oxidative coupling of phenylphosphine oxide)

RN 133545-15-0 CAPLUS

CN Phosphine oxide, 1,1'-(6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[1,1-diphenyl- (CA INDEX NAME)



L3 ANSWER 23 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1999:425600 CAPLUS

DOCUMENT NUMBER: 131:44958

TITLE: Process for the manufacture of bis(phosphine oxide) and bis(phosphonate) compounds

INVENTOR(S): Foricher, Joseph; Schmid, Rudolf

PATENT ASSIGNEE(S): F. Hoffmann-La Roche A.-G., Switz.

SOURCE: Eur. Pat. Appl., 17 pp.
CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

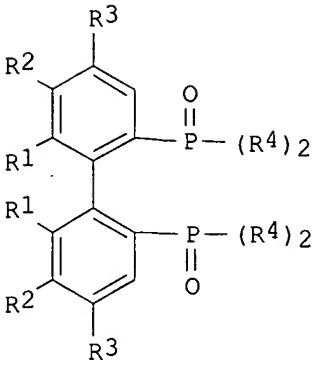
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 926152	A1	19990630	EP 1998-123996	19981217
EP 926152	B1	20020911		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
US 6162929	A	20001219	US 1998-212646	19981215
AT 223923	T	20020915	AT 1998-123996	19981217
ES 2182211	T3	20030301	ES 1998-123996	19981217
CA 2256828	A1	19990623	CA 1998-2256828	19981218
JP 11246576	A	19990914	JP 1998-364044	19981222
CN 1224019	A	19990728	CN 1998-125786	19981223
CN 1132839	B	20031231		

PRIORITY APPLN. INFO.: EP 1997-122720 A 19971223
EP 1998-123996 A 19981217

OTHER SOURCE(S): CASREACT 131:44958; MARPAT 131:44958

GI



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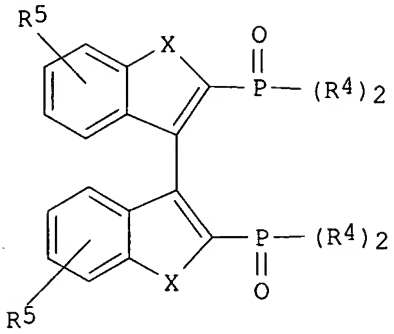


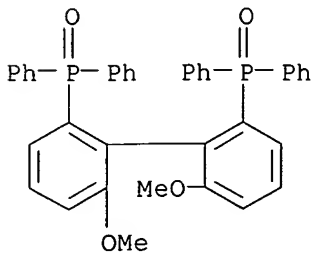
II

AB A process for the manufacture of bisphosphine oxide compds. I and II (R1, R2 = H, C1-8 alkyl, (un)substituted Ph, C1-8 alkoxy, phenyloxy, benzyloxy, halo, di-C1-8 alkylamino; R1R2 = fused ring, etc.; R3, R5 = H, C1-8 alkyl, (un)substituted Ph, C1-8 alkoxy, (un)substituted phenyloxy, benzyloxy, halo, di-C1-8 alkylamino; R4 = C1-8 alkoxy, (un)substituted phenyloxy, C1-8 alkyl, C3-7 cycloalkyl, (un)substituted Ph, naphthyl, heteroaryl, etc.; X = O, S) and bisphosphonates as intermediates for the production of bisphosphine ligands, in which in a single step process (a) a phosphine oxide compound is reacted in an organic solvent at -70°-20° with 0.5-3 equivalent of a lithium or magnesium amide compound, (b) 0.5-3 equivalent of oxidatively-acting metal salt or metal salt complex are added to the mixture obtained in stage (a) in a temperature range of -70°-20°, with a racemate of a bisphosphine oxide compound being obtained; (c) a racemate cleavage is carried out if desired; and (d) the bisphosphonates obtained in stage (b) or (c) are converted into bisphosphine oxides. Thus, Grignard reaction of 3-bromoanisole with P-chlorodiphenylphosphine in THF followed by H2O2 oxidation gave 88.8% (3-methoxyphenyl)diphenylphosphine oxide. Coupling reaction of (3-methoxyphenyl)diphenylphosphine oxide in the presence of FeCl3 gave title compound I (R1 = OMe, R2, R3 = H, R4 = Ph).

IT 133545-15-0P 133545-18-3P 145209-14-9P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of)

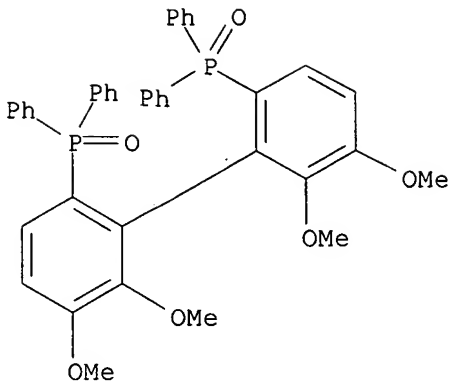
RN 133545-15-0 CAPLUS

CN Phosphine oxide, 1,1'-(6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[1,1-diphenyl- (CA INDEX NAME)

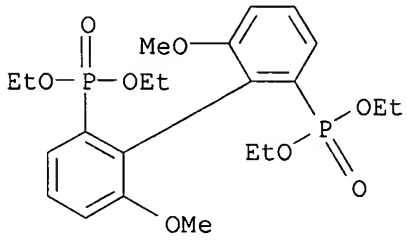


RN 133545-18-3 CAPLUS

CN Phosphine oxide, (5,5',6,6'-tetramethoxy[1,1'-biphenyl]-2,2'-diyl)bis[diphenyl- (9CI) (CA INDEX NAME)



RN 145209-14-9 CAPLUS
CN Phosphonic acid, P,P'-(6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis-, P,P,P',P'-tetraethyl ester (CA INDEX NAME)



REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 24 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 1999:348800 CAPLUS
DOCUMENT NUMBER: 131:102342
TITLE: Synthesis and use of water-soluble sulfonated dibenzofuran-based phosphine ligands
AUTHOR(S): Gelpke, Arjan E. Sollewijn; Veerman, Johan J. N.; Goedheijt, Marcel Schreuder; Kamer, Paul C. J.; Van Leeuwen, Piet W. N. M.; Hiemstra, Henk
CORPORATE SOURCE: Laboratories of Inorganic and Organic Chemistry, Institute of Molecular Chemistry, University of Amsterdam, Amsterdam, 1018 WS, Neth.
SOURCE: Tetrahedron (1999), 55(21), 6657-6670
CODEN: TETRAB; ISSN: 0040-4020
PUBLISHER: Elsevier Science Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 131:102342

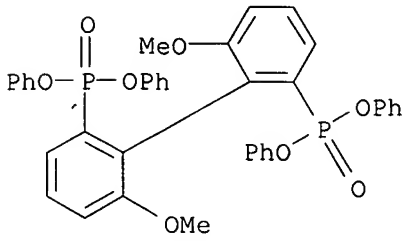
AB The syntheses of three triphenylphosphine analogs with one, two or three Ph groups replaced by 2-dibenzofuranyl groups, resp., and one enantiopure analog of the atropisomeric diphosphine MeO-BIPHEP with all four Ph groups replaced by 2-dibenzofuranyl are reported. Sulfonation of these compds. with sulfuric acid at room temperature proceeded with complete regioselectivity at the 8-position in the dibenzofuran moieties. These results proved the usefulness of dibenzofuran as a structural moiety in the synthesis of water-soluble phosphine ligands. The dibenzofuran-based, water-soluble triphenylphosphine analogs were used as ligands in palladium-catalyzed aqueous phase Heck and Suzuki reactions and in the rhodium-catalyzed two-phase hydroformylation of propene.

IT 145209-12-7P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT

(Reactant or reagent)
(preparation and Grignard reaction with dibenzofuranylmagnesium bromide)

RN 145209-12-7 CAPLUS

CN Phosphonic acid, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis-, tetraphenyl ester (9CI) (CA INDEX NAME)



IT 230635-54-8DP, complex

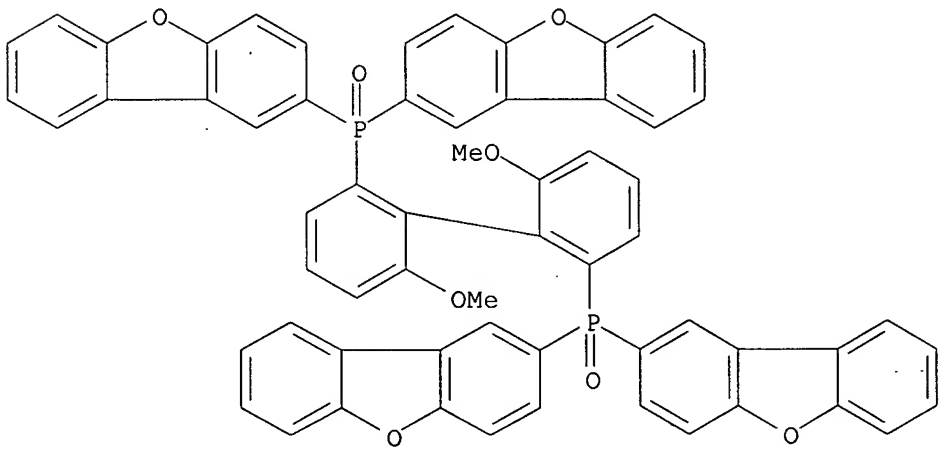
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and decomplexation of)

RN 230635-54-8 CAPLUS

CN Butanedioic acid, 2,3-bis(phenylmethoxy)-, (2R,3R)-, compd. with [(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[di-2-dibenzofuranylphosphine oxide] (1:1) (9CI) (CA INDEX NAME)

CM 1

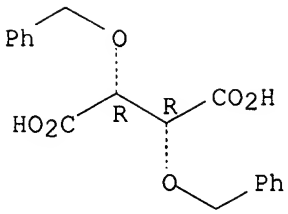
CRN 230635-53-7
CMF C62 H40 O8 P2



CM 2

CRN 138794-81-7
CMF C18 H18 O6

Absolute stereochemistry. Rotation (-).



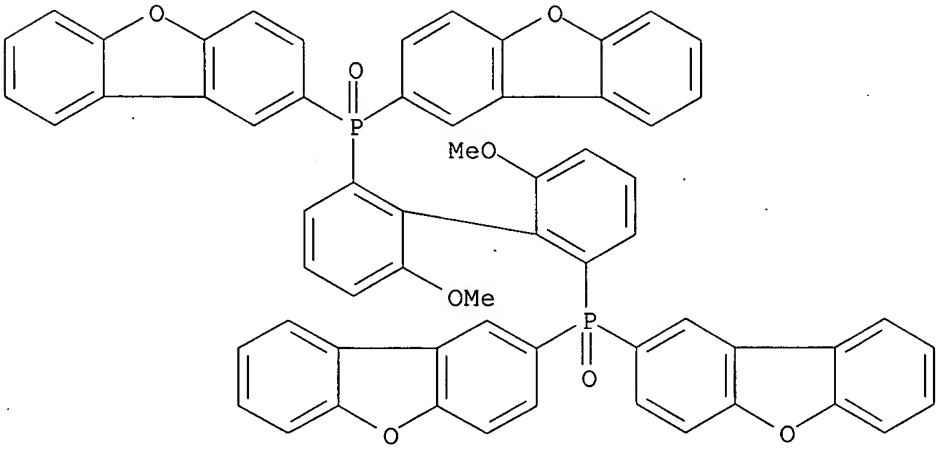
IT 230635-56-0DP, complex 230635-57-1DP, complex
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and hydrolysis of)

RN 230635-56-0 CAPLUS

CN Butanedioic acid, 2,3-bis(phenylmethoxy)-, (2R,3R)-, compd. with [(1R)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[di-2-dibenzofuranylphosphine oxide] (1:1) (9CI) (CA INDEX NAME)

CM 1

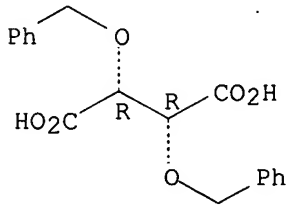
CRN 230635-55-9
CMF C62 H40 O8 P2



CM 2

CRN 138794-81-7
CMF C18 H18 O6

Absolute stereochemistry. Rotation (-).

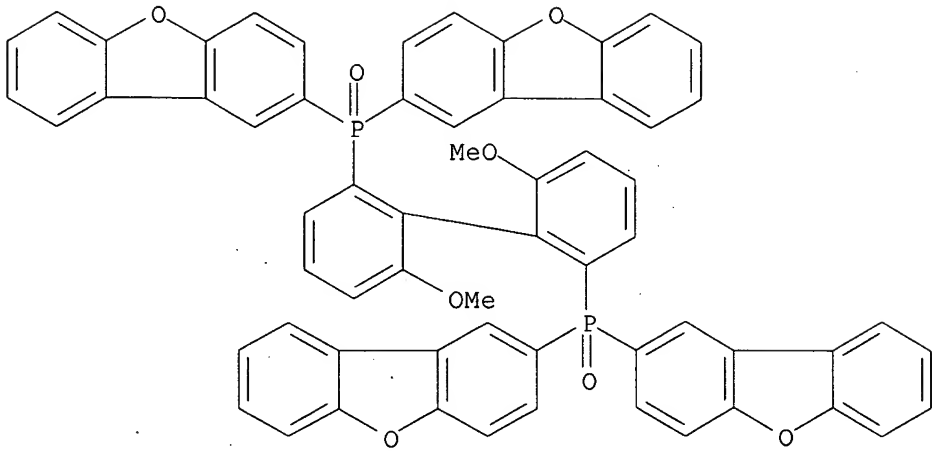


RN 230635-57-1 CAPLUS

CN Butanedioic acid, 2,3-bis(phenylmethoxy)-, (2S,3S)-, compd. with [(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[di-2-dibenzofuranylphosphine oxide] (1:1) (9CI) (CA INDEX NAME)

CM 1

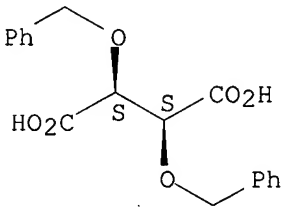
CRN 230635-55-9
CMF C62 H40 O8 P2



CM 2

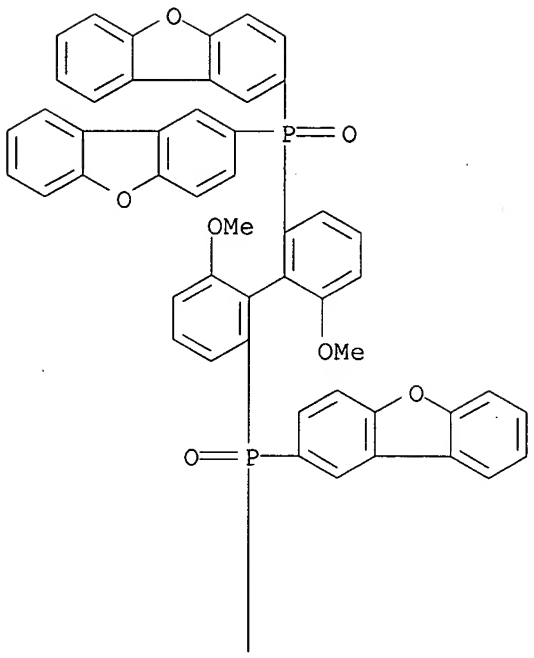
CRN 116679-01-7
CMF C18 H18 O6

Absolute stereochemistry. Rotation (+).

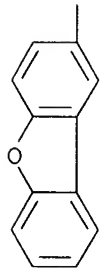


IT 230310-72-2P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and optical resolution of)
RN 230310-72-2 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis(2-dibenzofuranyl)- (9CI) (CA INDEX NAME)

PAGE 1-A



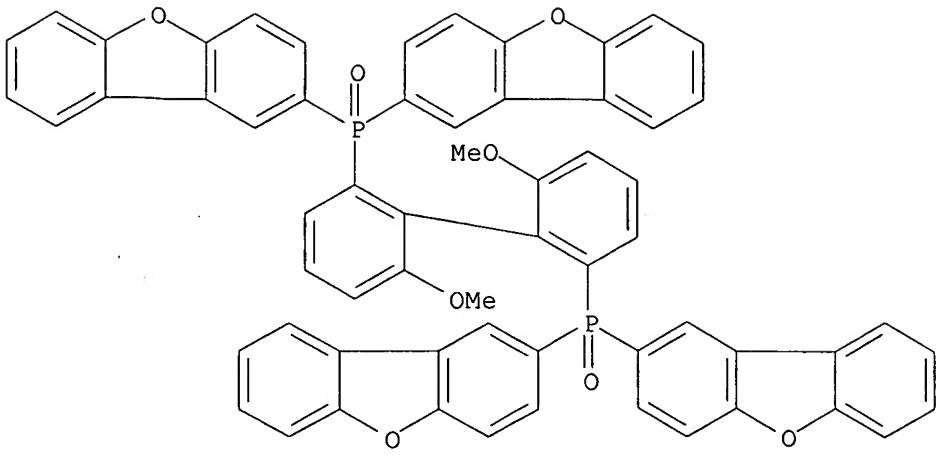
PAGE 2-A



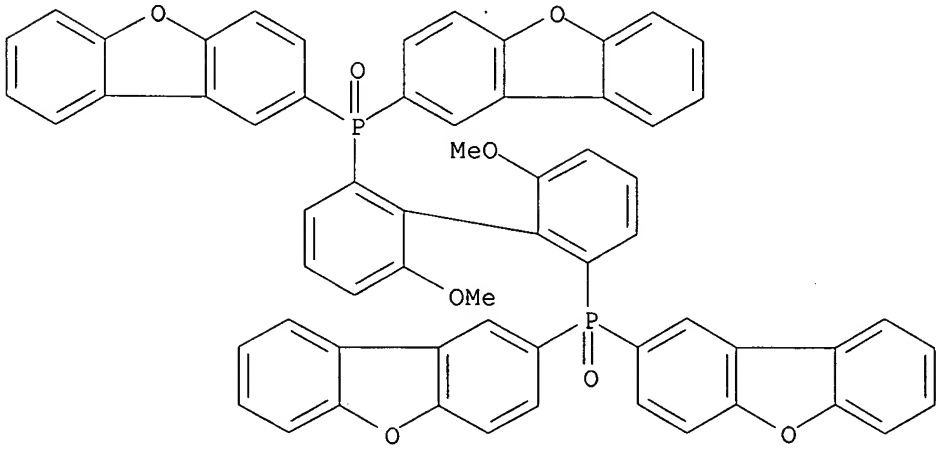
IT 230635-53-7P 230635-55-9P
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(preparation as cocatalyst for Heck and Suzuki reaction and hydroformylation of propene)

RN 230635-53-7 CAPLUS

CN Phosphine oxide, [(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[di-2-dibenzofuranyl- (9CI) (CA INDEX NAME)



RN 230635-55-9 CAPLUS
CN Phosphine oxide, [(1R)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[di-2-dibenzofuranyl- (9CI) (CA INDEX NAME)



REFERENCE COUNT: 51 THERE ARE 51 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 25 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 1997:94054 CAPLUS
DOCUMENT NUMBER: 126:104246
TITLE: Preparation of enantiomerically pure bisphosphines and use of their Group VIII metal complexes as catalysts for asymmetric hydrogenation
INVENTOR(S): Laue, Christian; Schroeder, Georg; Arlt, Dieter
PATENT ASSIGNEE(S): Bayer A.-G., Germany
SOURCE: Eur. Pat. Appl., 13 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 749973	A1	19961227	EP 1996-109252	19960610
EP 749973	B1	20011114		

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LI, LU, MC, NL, PT, SE

DE 19522293	A1	19970102	DE 1995-19522293		19950620
AT 208782	T	20011115	AT 1996-109252		19960610
PT 749973	T	20020429	PT 1996-109252		19960610
ES 2167489	T3	20020516	ES 1996-109252		19960610
US 5710339	A	19980120	US 1996-664073		19960613
TW 427994	B	20010401	TW 1996-85107135		19960614
CA 2179244	A1	19961221	CA 1996-2179244		19960617
CA 2179244	C	20060822			
JP 09003082	A	19970107	JP 1996-175446		19960617
JP 3862784	B2	20061227			
IL 118670	A	20000726	IL 1996-118670		19960617
HU 9601699	A2	19970428	HU 1996-1699		19960620
HU 9601699	A3	19970828			
HU 215283	B	19981130			
US 5801261	A	19980901	US 1997-953473		19971017
PRIORITY APPLN. INFO.:			DE 1995-19522293	A	19950620
			US 1996-664073	A1	19960613

OTHER SOURCE(S): CASREACT 126:104246; MARPAT 126:104246

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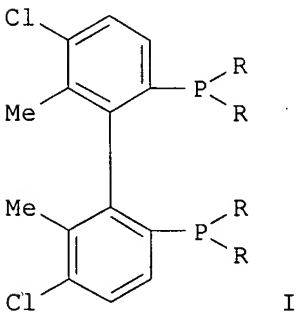


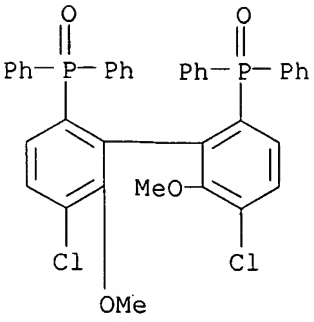
I

AB Enantiomers of I, a procedure for their preparation, their use to make Group VIII metal complexes, and use of the complexes as asym. hydrogenation catalysts are claimed. In I, R = Ph with optionally 1-3 substituents = OR1, R1, nitro, NH2, NHR1, NR12 (R1 = C2-6 alkyl), C2-7 alkyl, or C3-7 cycloalkyl. For example, I (R = Ph) was prepared via the following steps: a Grignard reaction of 5-bromo-2-chloroanisole with Ph2P(O)Cl gave diphenyl(4-chloro-3-methoxyphenyl)phosphine oxide, which was iodinated at the 2 position; coupling of the iodinated derivative using Cu/DMF gave the racemic P,P-dioxide of I, which was resolved by fractional crystallization using (-)-dibenzoyltartaric acid; the phosphine oxide enantiomers were then reduced by Cl3SiH in xylene/Bu3N to give the enantiomers of I. Examples show how Ru complexes of one of the enantiomers catalyzed hydrogenation of 2-(3-benzylphenyl)propenoic acid with 88% enantiomeric excess (ee) and of Me acetate with 97% ee.

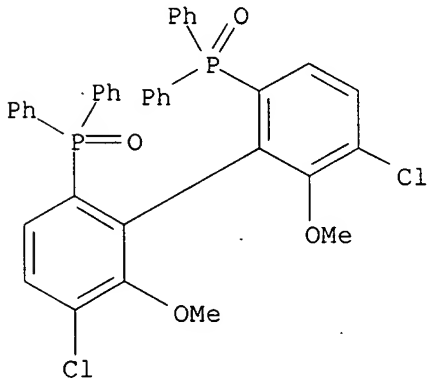
IT 185836-54-8P
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); RACT (Reactant or reagent)
(preparation of enantiomerically pure bisphosphines and use of Group VIII metal complexes as catalysts for asym. hydrogenation)

RN 185836-54-8 CAPLUS

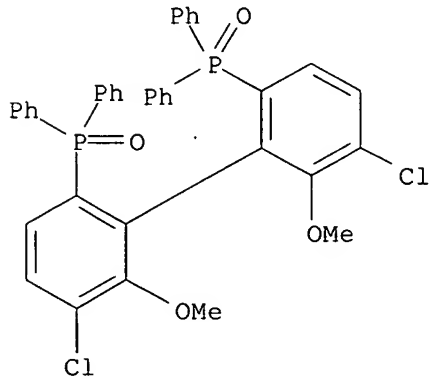
CN Phosphine oxide, [3',5-dichloro-6'-(diphenylphosphinyl)-2',6-dimethoxy[1,1'-biphenyl]-2-yl]diphenyl- (CA INDEX NAME)



IT 185913-95-5P 185913-96-6P
RL: PUR (Purification or recovery); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation of enantiomerically pure bisphosphines and use of Group VIII metal complexes as catalysts for asym. hydrogenation)
RN 185913-95-5 CAPLUS
CN Phosphine oxide, [(1S)-5,5'-dichloro-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



RN 185913-96-6 CAPLUS
CN Phosphine oxide, [(1R)-5,5'-dichloro-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



L3 ANSWER 26 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 1994:298626 CAPLUS
DOCUMENT NUMBER: 120:298626

TITLE: Asymmetric hydrogenation with optically active ruthenium diphosphine catalysts and application to a cilazapril intermediate

INVENTOR(S): Broger, Emil Albin; Crameri, Yvo; Imfeld, Marquard; Montavon, Francois; Widmer, Erich

PATENT ASSIGNEE(S): F. Hoffmann-La Roche & Co. AG, Switz.

SOURCE: Eur. Pat. Appl., 18 pp.
CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: German

FAMILY ACC. NUM. COUNT: 5

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 570764	A2	19931124	EP 1993-107272	19930505
EP 570764	A3	19940629		
EP 570764	B1	20010718		
R: AT, BE, CH, DE, DK, ES, FR, GB, IT, LI, NL				
AT 203242	T	20010815	AT 1993-107272	19930505
ES 2164056	T3	20020216	ES 1993-107272	19930505
JP 06032780	A	19940208	JP 1993-114776	19930517
JP 3526310	B2	20040510		
US 5750690	A	19980512	US 1996-690215	19960726

PRIORITY APPLN. INFO.:

CH 1992-1582	A	19920518
CH 1993-729	A	19930311
US 1993-57231	B1	19930504
US 1994-330404	B1	19941028

OTHER SOURCE(S): CASREACT 120:298626; MARPAT 120:298626

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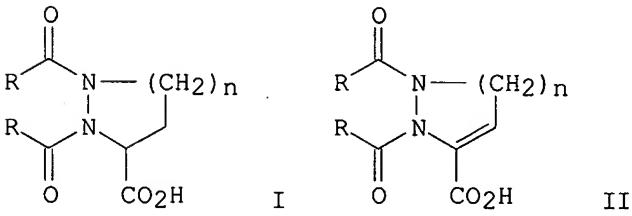
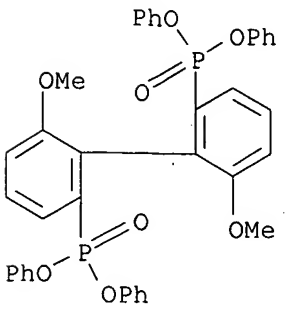


I II

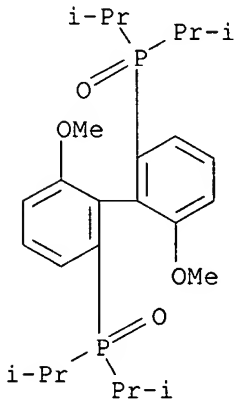
AB (R)- or (S)-stereoisomers of heterocycles I [R = alkyl, arylmethyl, aryl, alkoxy, arylmethoxy, aryloxy; or RR = CH2, CH2CH2, 1,2-C6H4; n = 1, 2, 3] are prepared by asym. hydrogenation of corresponding unsatd. heterocycles II or their salts in the presence of optically active Ru diphosphine complexes as catalysts. Addnl. claims specify the diphosphines, and the example product and reactant given below, and cover starting materials and their preparation For example, hydrogenation of the tetrahydropyridazinophthalazine II (RR = 1,2-C6H4, n = 2) in MeOH containing Et3N and the complex Ru(OAc)2[(S)-p-TolMeOBIPHEP] [cited ligand = (S)-(6,6'-dimethoxybiphenyl-2,2'-diyl)bis[di-(p-tolyl)phosphine]] at 60° and 40 bar gave 100% conversion in 1 h. Workup and acidic precipitation of product gave (S)-I (RR = 1,2-C6H4, n = 2) [(S)-III], an intermediate for the antihypertensive cilazapril, in 96% yield and 98.9% optical purity. Addnl. similar catalysts gave 85-95% yield and 97.3-98.9% optical purity for the same reaction. Addnl. examples include analogous preparation of (R)-III, and prepns. of the starting material.

IT 145265-37-8
RL: RCT (Reactant); RACT (Reactant or reagent)
(Grignard reaction of, in preparation of ligand for ruthenium hydrogenation catalysts)

RN 145265-37-8 CAPLUS
CN Phosphonic acid, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis-, tetraphenyl ester, (S)- (9CI) (CA INDEX NAME)



IT 150971-42-9P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and reduction of, in preparation of ligand for ruthenium catalysts)
RN 150971-42-9 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis(1-methylethyl)-, (S)- (9CI) (CA INDEX NAME)



L3 ANSWER 27 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 1993:671399 CAPLUS
DOCUMENT NUMBER: 119:271399
TITLE: Preparation of racemic and optically active diphosphine ligands for use in ruthenium asymmetric hydrogenation catalysts for prochiral allylic systems
INVENTOR(S): Foricher, Joseph; Schmid, Rudolf
PATENT ASSIGNEE(S): Hoffmann-La Roche, F., und Co. A.-G., Switz.
SOURCE: PCT Int. Appl., 19 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 5
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9315091	A1	19930805	WO 1993-CH26	19930201
W: JP, US				
RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				

EP 579797	A1	19940126	EP 1993-902021	19930201
EP 579797	B1	19990421		
R: AT, BE, CH, DE, DK, ES, FR, GB, IT, LI, NL				
JP 06506475	T	19940721	JP 1993-506424	19930201
JP 3369558	B2	20030120		
AT 179981	T	19990515	AT 1993-902020	19930201
AT 179176	T	19990515	AT 1993-902021	19930201
ES 2131575	T3	19990801	ES 1993-902021	19930201
ES 2132215	T3	19990816	ES 1993-902020	19930201
EP 565975	A2	19931020	EP 1993-105548	19930403
EP 565975	A3	19931103		
EP 565975	B1	19960904		
R: AT, BE, CH, DE, DK, ES, FR, GB, IT, LI, NL				
AT 142191	T	19960915	AT 1993-105548	19930403
ES 2091509	T3	19961101	ES 1993-105548	19930403
JP 06025035	A	19940201	JP 1993-109833	19930414
JP 3310381	B2	20020805		
US 5457219	A	19951010	US 1993-122488	19930927
US 5514805	A	19960507	US 1994-225408	19940408
US 5600015	A	19970204	US 1995-445068	19950519
US 5750690	A	19980512	US 1996-690215	19960726
PRIORITY APPLN. INFO.:			CH 1992-289	A 19920131
			CH 1992-1270	A 19920416
			CH 1992-1582	A 19920518
			CH 1992-1944	A 19920619
			US 1993-10120	B1 19930128
			WO 1993-CH26	W 19930201
			CH 1993-729	A 19930311
			US 1993-44519	B1 19930408
			US 1993-57231	B1 19930504
			US 1994-203859	B1 19940301
			US 1994-330404	B1 19941028

OTHER SOURCE(S): CASREACT 119:271399; MARPAT 119:271399

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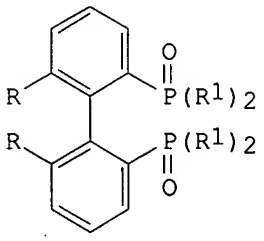


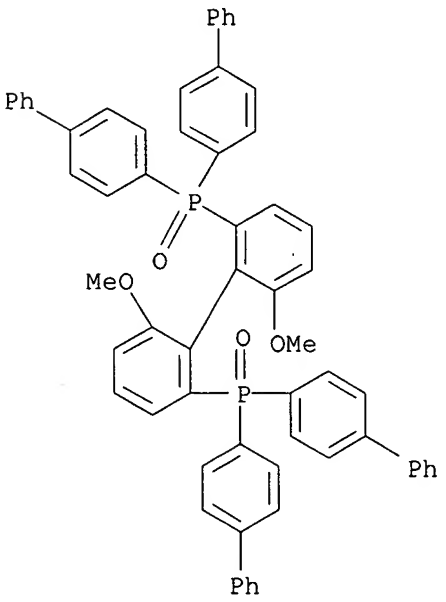
I

AB Described are racemic optically active phosphorus compds. of the formula I, in which R is a lower alkyl or lower alkoxy group and R1 is a lower alkyl, cycloalkyl or substituted Ph group. The compds. of the formula I act, in the form of complexes with a group (IV) metal, i.e., di(η2-acetato)(η4-1,5-cyclooctadiene)ruthenium (II) (II), as catalysts for asym. hydrogenation reactions and enantiomer-selective hydrogen displacement reactions in prochiral allylic systems. E.g., hydrogenation of 3,4,6,11-tetrahydro-6,11-dioxopyridazo[1,2a]phthalazine-1-carboxylic acid by treatment with H2 and II and [(S)-6,6'-dimethoxybiphenyl-2,2'-diyl]bis[diisopropylphosphine] gave (S)-1,2,3,4,6,11-hexahydro-6,11-dioxopyridazo[1,2b]phthalazine-1-carboxylic acid in 96% yield.

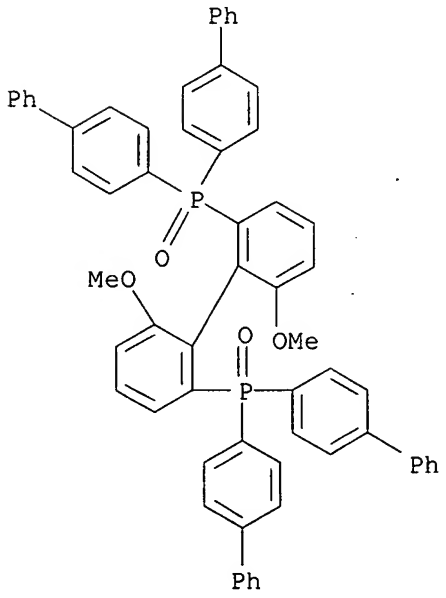
IT 145209-28-5P 145209-29-6P 150971-32-7P
150971-34-9P 150971-36-1P 150971-38-3P
150971-40-7P 150971-42-9P 150971-44-1P
150971-46-3P 150971-48-5P 150971-50-9P
150971-52-1P 150971-54-3P 150971-56-5P
150971-58-7P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and reduction of, ligand for metal catalyst of asym. hydrogenation
reaction by)

RN 145209-28-5 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis([1,1'-biphenyl]-4-yl)-, (R)- (9CI) (CA INDEX NAME)



RN 145209-29-6 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis([1,1'-biphenyl]-4-yl)-, (S)- (9CI) (CA INDEX NAME)



RN 150971-32-7 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis([1,1':3',1''-terphenyl]-5'-yl)-, (S)- (9CI) (CA INDEX NAME)

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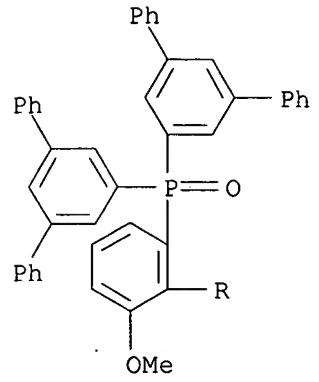
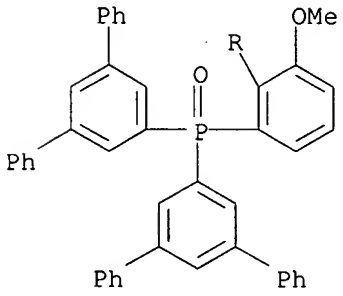
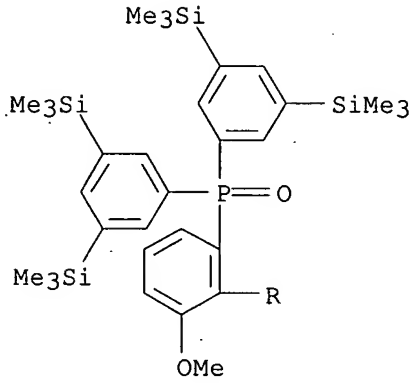


PAGE 2-A

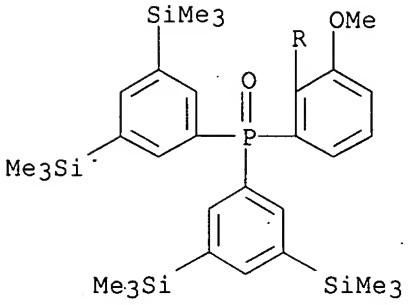


RN 150971-34-9 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis[3,5-bis(trimethylsilyl)phenyl]-, (R)- (9CI) (CA INDEX NAME)

PAGE 1-A

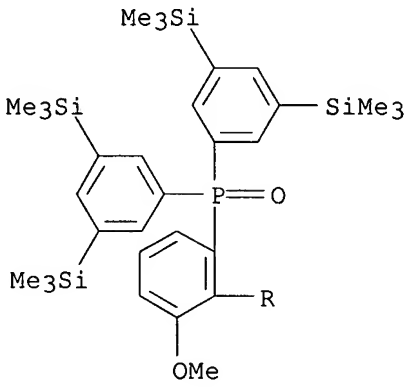


PAGE 2-A

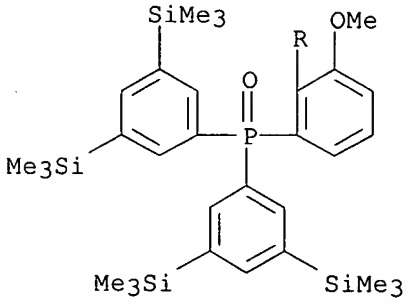


RN 150971-36-1 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis[3,5-bis(trimethylsilyl)phenyl]-, (S)- (9CI) (CA INDEX NAME)

PAGE 1-A

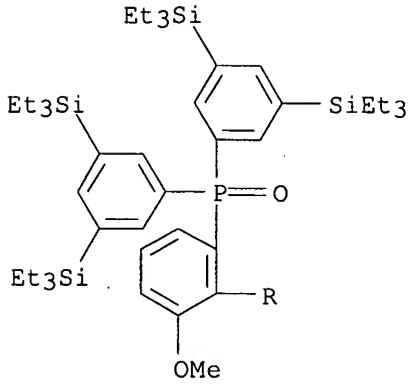


PAGE 2-A

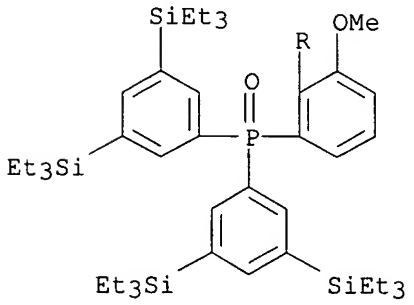


RN 150971-38-3 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis[3,5-bis(triethylsilyl)phenyl]-, (R)- (9CI) (CA INDEX NAME)

PAGE 1-A

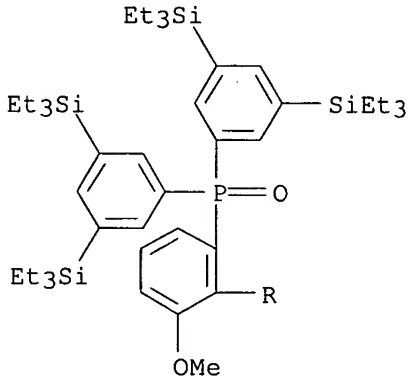


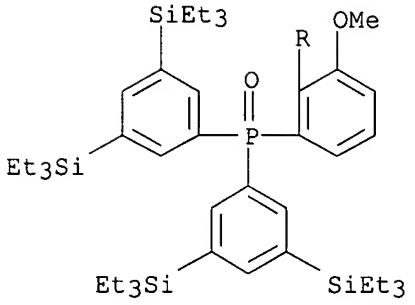
PAGE 2-A



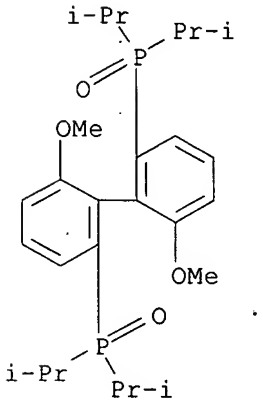
RN 150971-40-7 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis[3,5-bis(triethylsilyl)phenyl]-, (S)- (9CI) (CA INDEX NAME)

PAGE 1-A

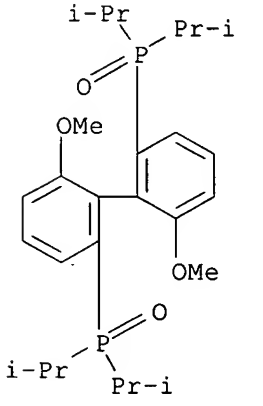




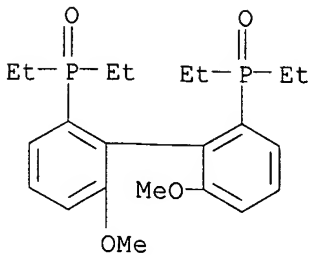
RN 150971-42-9 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis(1-methylethyl)-, (S)- (9CI) (CA INDEX NAME)



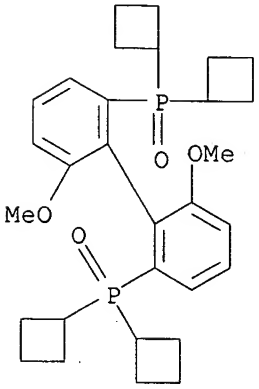
RN 150971-44-1 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis(1-methylethyl)-, (R)- (9CI) (CA INDEX NAME)



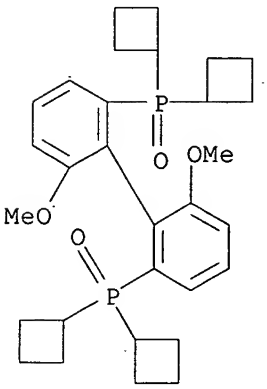
RN 150971-46-3 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[diethyl- (9CI) (CA INDEX NAME)



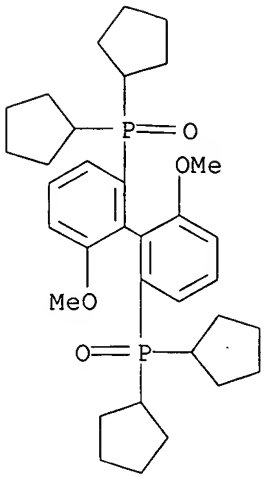
RN 150971-48-5 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[dicyclobutyl-, (R)- (9CI) (CA INDEX NAME)



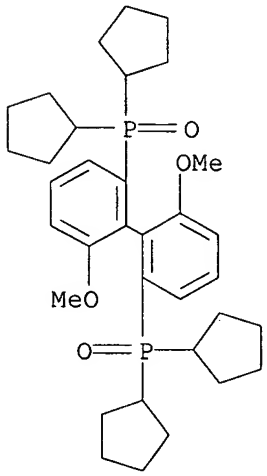
RN 150971-50-9 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[dicyclobutyl-, (S)- (9CI) (CA INDEX NAME)



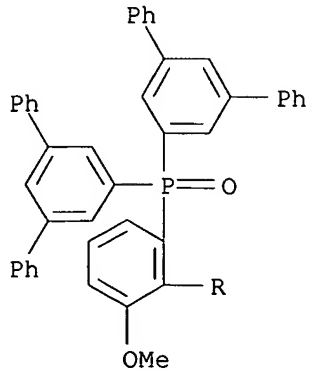
RN 150971-52-1 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[dicyclopentyl-, (R)- (9CI) (CA INDEX NAME)

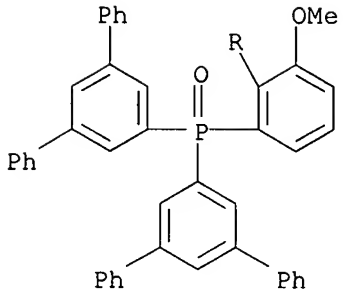


RN 150971-54-3 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[dicyclopentyl-, (S)- (9CI) (CA INDEX NAME)

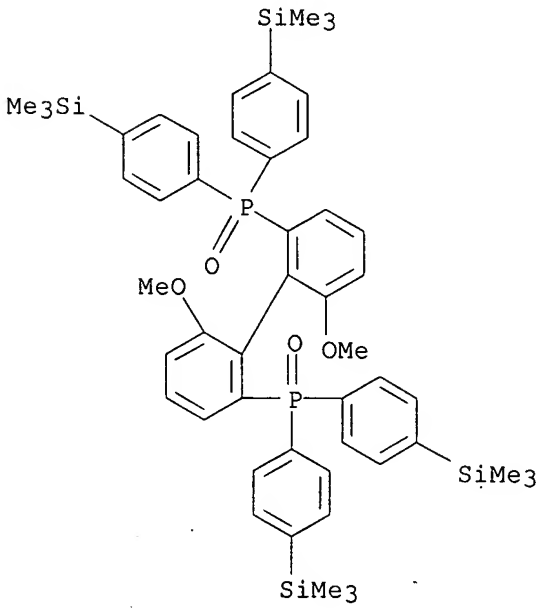


RN 150971-56-5 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis([1,1':3',1''-terphenyl]-5'-yl)-, (R)- (9CI) (CA INDEX NAME)

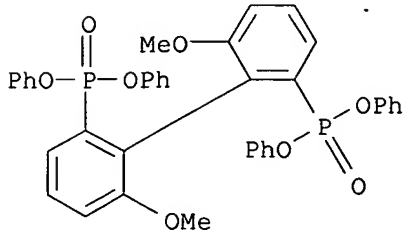




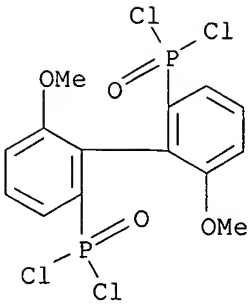
RN 150971-58-7 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis[4-(trimethylsilyl)phenyl]-, (R)- (9CI) (CA INDEX NAME)



IT 145209-12-7 145265-39-0
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with biphenyl Grignard reagent)
RN 145209-12-7 CAPLUS
CN Phosphonic acid, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis-, tetraphenyl ester (9CI) (CA INDEX NAME)



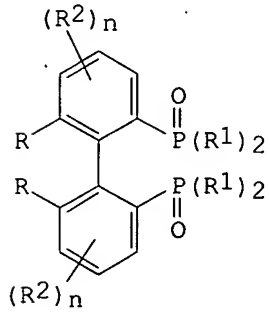
RN 145265-39-0 CAPLUS
CN Phosphonic dichloride, [(1R)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis- (9CI) (CA INDEX NAME)



L3 ANSWER 28 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 1993:147774 CAPLUS
DOCUMENT NUMBER: 118:147774
TITLE: Preparation and resolution of biphenyl-1,1'-diphosphonates
INVENTOR(S): Foricher, Joseph; Heiser, Bernd; Schmid, Rudolf
PATENT ASSIGNEE(S): Hoffmann-La Roche, F., und Co. A.-G., Switz.
SOURCE: PCT Int. Appl., 25 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
WO 9216535	A1	19921001	WO 1992-CH50		19920312
W: JP, US					
RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, MC, NL, SE					
EP 530335	A1	19930310	EP 1992-905278		19920312
EP 530335	B1	19960814			
R: AT, BE, CH, DE, DK, FR, GB, IT, LI, NL, SE					
JP 05507503	T	19931028	JP 1992-505915		19920312
JP 3204668	B2	20010904			
AT 141278	T	19960815	AT 1992-905278		19920312
US 5302738	A	19940412	US 1992-949878		19921113
PRIORITY APPLN. INFO.:			CH 1991-794	A	19910315
			WO 1992-CH50	W	19920312

OTHER SOURCE(S): MARPAT 118:147774
GI



I

AB Title compds. (I; R = alkyl, alkoxy, protected OH; R1 = alkoxy, PhO, PhCH2O, Cl, Br; R2 = alkyl, alkoxy; n = 0-2), were prepared Thus, di-Ph 2-iodo-3-(methoxyphenyl)phosphonate (preparation from 3-bromoanisole given) was

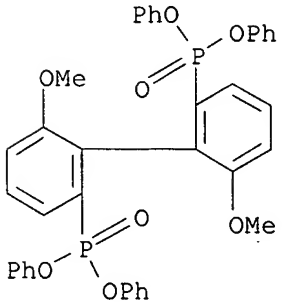
heated with activated Cu powder in DMF at 140° to give di-Ph RS-(6,6'-dimethoxybiphenyl-2,2'-diyl)bisphosphonate (RS-II). II was treated with (-)-O,O'-dibenzoyl-L-tartaric acid (III) in CH2Cl2/EtOAc to give (R)-II.III, which in CH2Cl2 was stirred with NaHCO3 in H2O to give (R)-II.

IT 145306-47-4P 145306-48-5P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and decomposition reaction of)

RN 145306-47-4 CAPLUS
CN Butanedioic acid, 2,3-bis(benzoyloxy)-, [R-(R*,R*)]-, compd. with (R)-tetraphenyl (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[phosphonate] (1:1) (9CI) (CA INDEX NAME)

CM 1

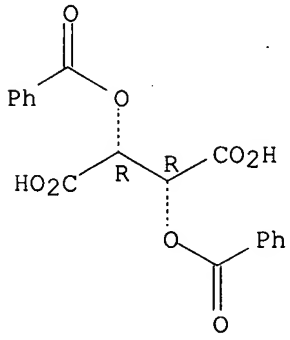
CRN 145265-36-7
CMF C38 H32 O8 P2



CM 2

CRN 2743-38-6
CMF C18 H14 O8

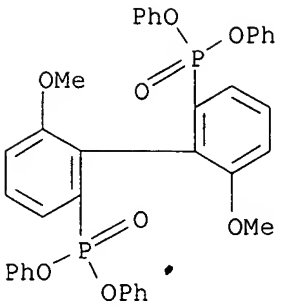
Absolute stereochemistry. Rotation (-).



RN 145306-48-5 CAPLUS
CN Butanedioic acid, 2,3-bis(benzoyloxy)-, [S-(R*,R*)]-, compd. with (S)-tetraphenyl (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[phosphonate] (1:1) (9CI) (CA INDEX NAME)

CM 1

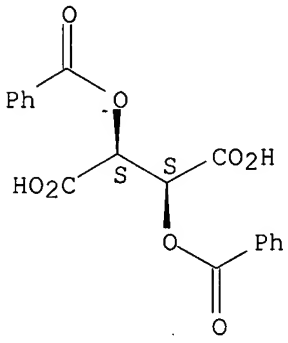
CRN 145265-37-8
CMF C38 H32 O8 P2



CM 2

CRN 17026-42-5
CMF C18 H14 O8

Absolute stereochemistry. Rotation (+).



IT 133545-23-0P 133577-82-9P 133577-84-1P
133577-88-5P 133577-89-6P 145209-27-4P
145209-28-5P 145209-29-6P 145265-43-6P
145265-44-7P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and reduction of)
RN 133545-23-0 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis(4-methylphenyl)- (9CI) (CA INDEX NAME)

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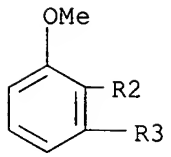

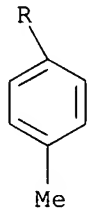

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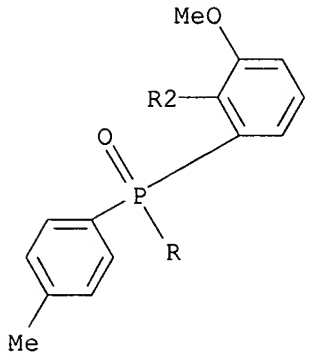

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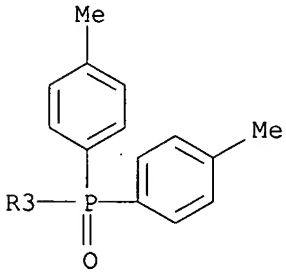
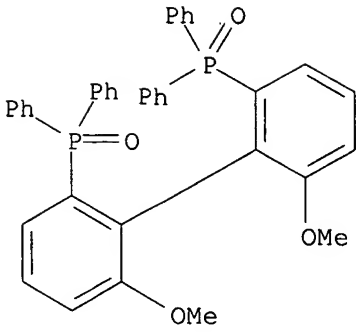
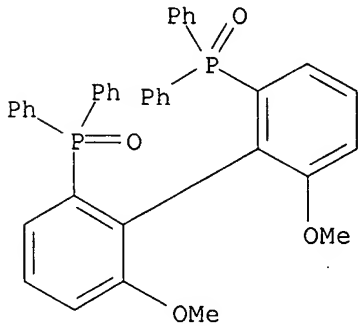


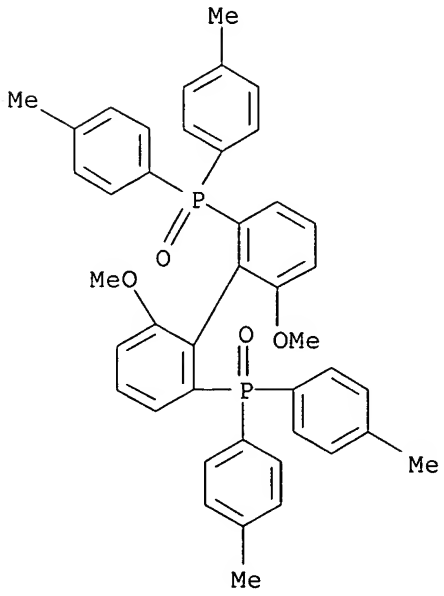
RN 133577-82-9 CAPLUS
CN Phosphine oxide, 1,1'-[(1R)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-diphenyl- (CA INDEX NAME)



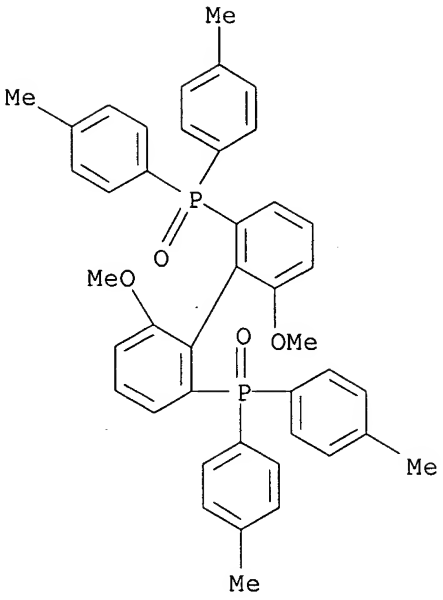
RN 133577-84-1 CAPLUS
CN Phosphine oxide, 1,1'-[(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-diphenyl- (CA INDEX NAME)



RN 133577-88-5 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis(4-methylphenyl)-, (R)- (9CI) (CA INDEX NAME)

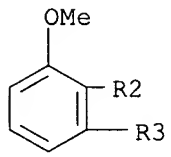


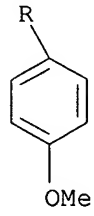
RN 133577-89-6 CAPLUS
CN Phosphine oxide, [(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[bis(4-methylphenyl)- (9CI) (CA INDEX NAME)



RN 145209-27-4 CAPLUS
CN Phosphine oxide, 1,1'-(6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[1,1-bis(4-methoxyphenyl)- (CA INDEX NAME)

PAGE 1-A





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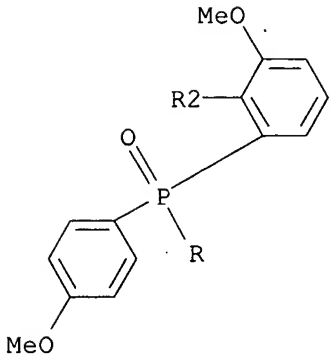
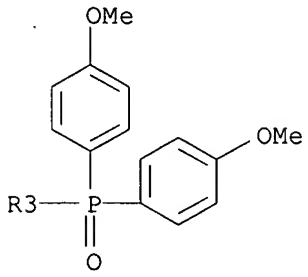
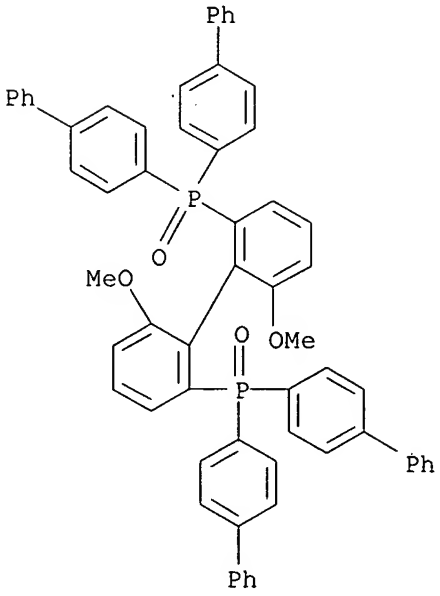


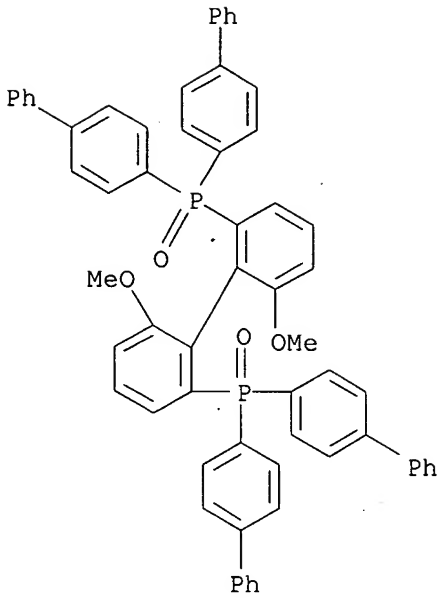
PAGE 3-A



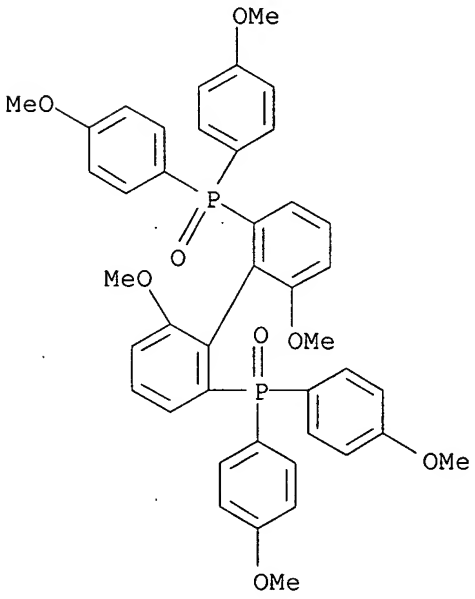
RN 145209-28-5 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis([1,1'-biphenyl]-4-yl)-, (R)- (9CI) (CA INDEX NAME)



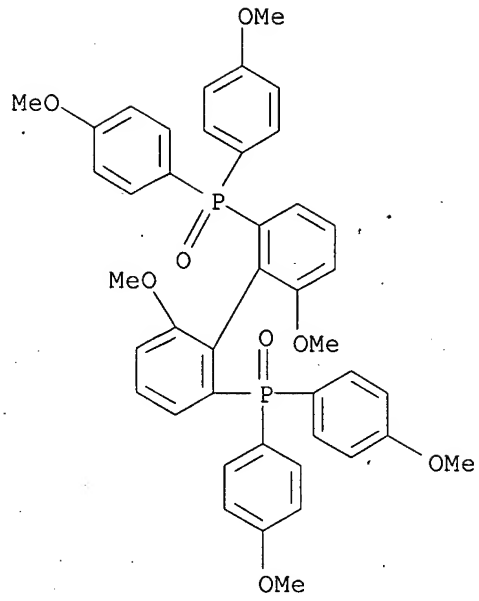
RN 145209-29-6 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis([1,1'-biphenyl]-4-yl)-, (S)- (9CI) (CA INDEX NAME)



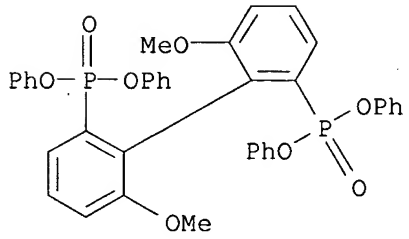
RN 145265-43-6 CAPLUS
CN Phosphine oxide, 1,1'-[(1R)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-bis(4-methoxyphenyl)- (CA INDEX NAME)



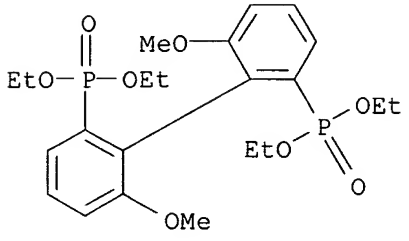
RN 145265-44-7 CAPLUS
CN Phosphine oxide, 1,1'-[(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-bis(4-methoxyphenyl)- (CA INDEX NAME)



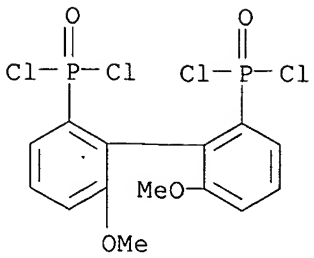
IT 145209-12-7P 145209-14-9P 145209-18-3P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation and resolution of)
RN 145209-12-7 CAPLUS
CN Phosphonic acid, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis-, tetraphenyl ester (9CI) (CA INDEX NAME)



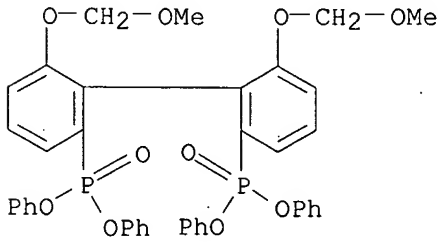
RN 145209-14-9 CAPLUS
CN Phosphonic acid, P,P'-(6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis-, P,P,P',P'-tetraethyl ester (CA INDEX NAME)



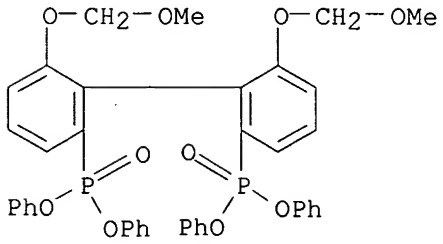
RN 145209-18-3 CAPLUS
CN Phosphonic dichloride, P,P'-(6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis- (CA INDEX NAME)



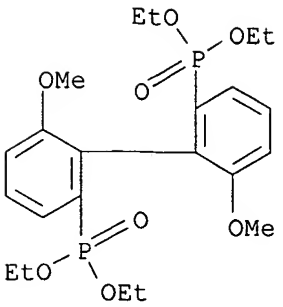
IT 145209-16-1P 145209-17-2P 145264-54-6P
145265-36-7P 145265-37-8P 145265-38-9P
145265-39-0P 145265-40-3P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of)
RN 145209-16-1 CAPLUS
CN Phosphonic acid, [6,6'-bis(methoxymethoxy)[1,1'-biphenyl]-2,2'-diyl]bis-, tetraphenyl ester, (R)- (9CI) (CA INDEX NAME)



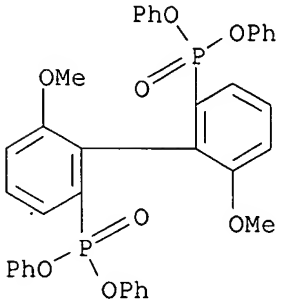
RN 145209-17-2 CAPLUS
CN Phosphonic acid, [6,6'-bis(methoxymethoxy)[1,1'-biphenyl]-2,2'-diyl]bis-, tetraphenyl ester, (S)- (9CI) (CA INDEX NAME)



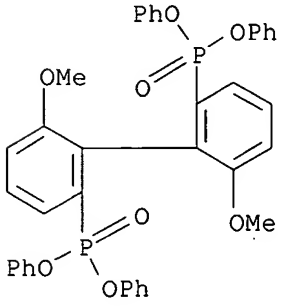
RN 145264-54-6 CAPLUS
CN Phosphonic acid, [(1R)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis-, tetraethyl ester (9CI) (CA INDEX NAME)



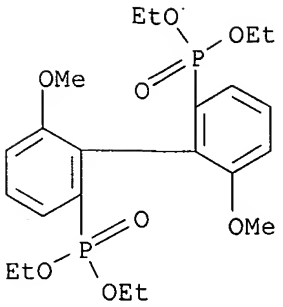
RN 145265-36-7 CAPLUS
CN Phosphonic acid, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis-, tetraphenyl ester, (R)- (9CI) (CA INDEX NAME)



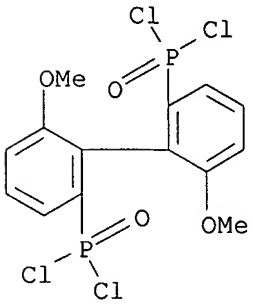
RN 145265-37-8 CAPLUS
CN Phosphonic acid, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis-, tetraphenyl ester, (S)- (9CI) (CA INDEX NAME)



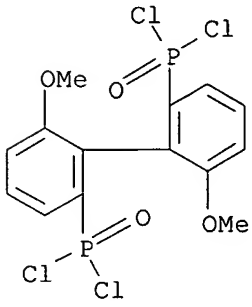
RN 145265-38-9 CAPLUS
CN Phosphonic acid, P,P'-[(1S)-2',6-dimethoxy[1,1'-biphenyl]-2,6'-diyl]bis-, P,P,P',P'-tetraethyl ester (CA INDEX NAME)



RN 145265-39-0 CAPLUS
CN Phosphonic dichloride, [(1R)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis- (9CI) (CA INDEX NAME)



RN 145265-40-3 CAPLUS
CN Phosphonic dichloride, P,P'-[(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis- (CA INDEX NAME)

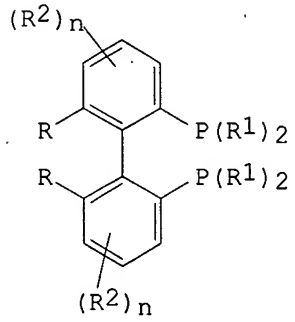


L3 ANSWER 29 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 1993:59878 CAPLUS
DOCUMENT NUMBER: 118:59878
TITLE: Preparation of racemic and optically active biphenyl-2,2-bisphosphines
INVENTOR(S): Broger, Emil Albin; Foricher, Joseph; Heiser, Bernd; Schmid, Rudolf
PATENT ASSIGNEE(S): Hoffmann-La Roche, F., und Co. A.-G., Switz.
SOURCE: PCT Int. Appl., 34 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
WO 9216536	A1	19921001	WO 1992-CH49		19920311
W: JP, US					
RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, MC, NL, SE					
EP 530336	A1	19930310	EP 1992-905551		19920311
EP 530336	B1	19960306			
R: AT, BE, CH, DE, DK, FR, GB, IT, LI, NL, SE					
JP 05507294	T	19931021	JP 1992-504836		19920311
JP 3204667	B2	20010904			
AT 135008	T	19960315	AT 1992-905551		19920311
US 5274125	A	19931228	US 1992-949871		19921113
PRIORITY APPLN. INFO.:			CH 1991-805	A	19910315
			CH 1992-697	A	19920305
			WO 1992-CH49	W	19920311

OTHER SOURCE(S): MARPAT 118:59878

GI



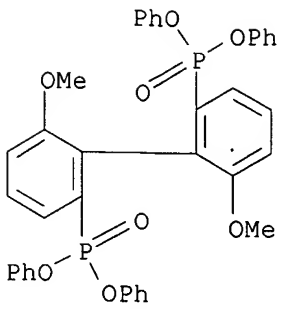
I

AB Title compds. (I; R = alkyl, alkoxy, protected OH; R1 = 5 ring atom containing heteroaryl; R2 = alkyl, alkoxy; n = 0-2), were prepared Thus, R-(6,6'-dimethoxybiphenyl-2,2'-diyl)bis(phosphonic acid di-Ph ester) (preparation given) in THF was added to the Grignard reagent from 2-iodofuran in THF and the mixture was stirred 1 h at 40° to give the bis(di-2-furylphosphine oxide), which was refluxed with Cl3SiH and Bu3N in xylene to give, after heating with aqueous NaOH, R-(6,6'-dimethoxybiphenyl-2,2'-diyl)bis(di-2-furylphosphine). I were used in asym. hydrogenation reactions.

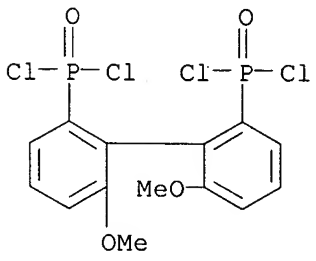
IT 145265-36-7P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and Grignard reaction of, with iodofuran)

RN 145265-36-7 CAPLUS

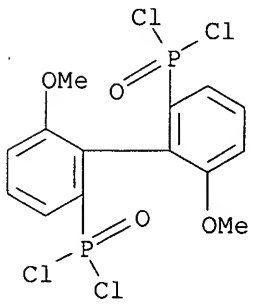
CN Phosphonic acid, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis-, tetraphenyl ester, (R)- (9CI) (CA INDEX NAME)



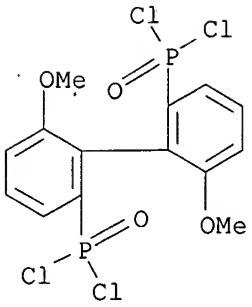
IT 145209-18-3P 145265-40-3P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and condensation of, with benzothiopehen derivative)
RN 145209-18-3 CAPLUS
CN Phosphonic dichloride, P,P'-(6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis- (CA INDEX NAME)



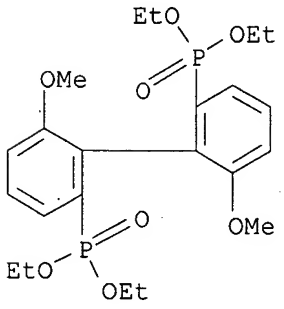
RN 145265-40-3 CAPLUS
CN Phosphonic dichloride, P,P'-[(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis- (CA INDEX NAME)



IT 145265-39-0P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and condensation of, with benzothiophene)
RN 145265-39-0 CAPLUS
CN Phosphonic dichloride, [(1R)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis- (9CI) (CA INDEX NAME)



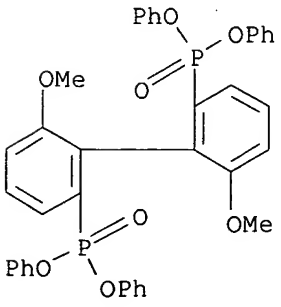
IT 145264-54-6P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation and conversion of, bis(phosphinyldichloride) derivative)
RN 145264-54-6 CAPLUS
CN Phosphonic acid, [(1R)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis-, tetraethyl ester (9CI) (CA INDEX NAME)



IT 145306-47-4P 145306-48-5P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and decomposition of)
RN 145306-47-4 CAPLUS
CN Butanedioic acid, 2,3-bis(benzoyloxy)-, [R-(R*,R*)]-, compd. with (R)-tetraphenyl (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[phosphonate] (1:1) (9CI) (CA INDEX NAME)

CM 1

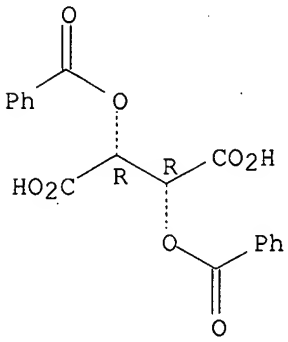
CRN 145265-36-7
CMF C38 H32 O8 P2



CM 2

CRN 2743-38-6
CMF C18 H14 O8

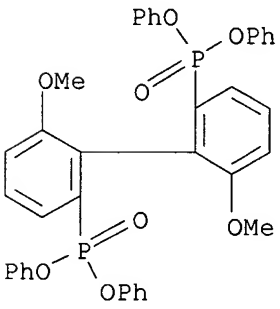
Absolute stereochemistry. Rotation (-).



RN 145306-48-5 CAPLUS
CN Butanedioic acid, 2,3-bis(benzoyloxy)-, [S-(R*,R*)]-, compd. with (S)-tetraphenyl (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[phosphonate] (1:1) (9CI) (CA INDEX NAME)

CM 1

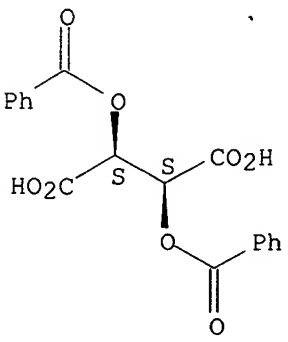
CRN 145265-37-8
CMF C38 H32 O8 P2



CM 2

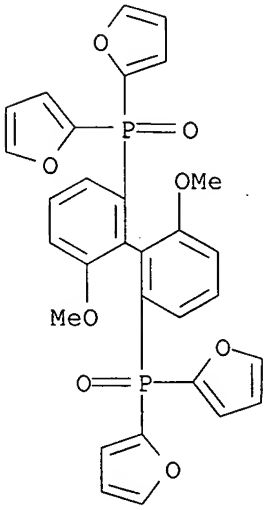
CRN 17026-42-5
CMF C18 H14 O8

Absolute stereochemistry. Rotation (+).

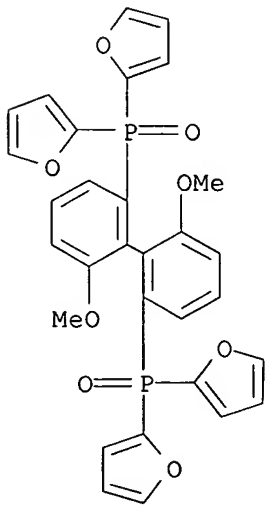


IT 145214-56-8P 145214-58-0P 145214-60-4P
145214-62-6P 145214-64-8P 145214-70-6P
145214-71-7P 145214-74-0P 145214-75-1P
145214-76-2P 145214-77-3P 145264-43-3P
145264-44-4P 145264-53-5P 145264-55-7P
145264-56-8P 145264-57-9P 145264-58-0P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and reduction of)

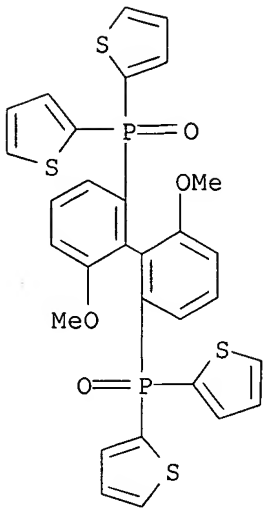
RN 145214-56-8 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[di-2-furanyl-, (R)- (9CI) (CA INDEX NAME)



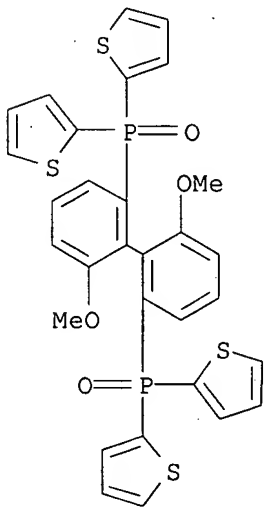
RN 145214-58-0 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[di-2-furanyl-, (S)- (9CI) (CA INDEX NAME)



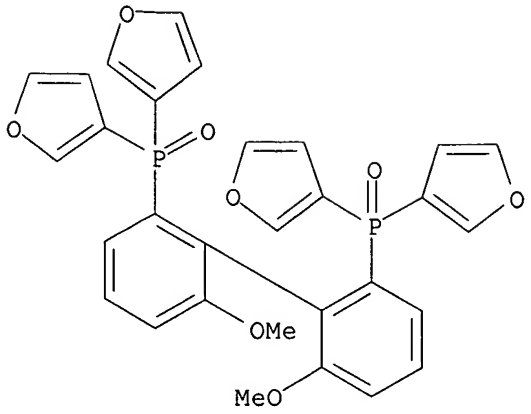
RN 145214-60-4 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[di-2-thienyl-, (R)- (9CI) (CA INDEX NAME)



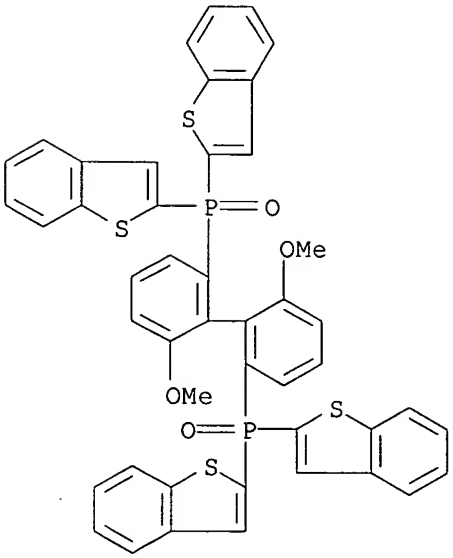
RN 145214-62-6 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[di-2-thienyl-, (S)- (9CI) (CA INDEX NAME)



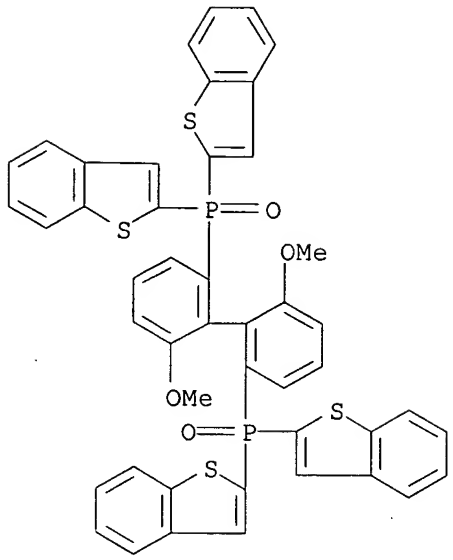
RN 145214-64-8 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[di-3-furanyl-
(9CI) (CA INDEX NAME)



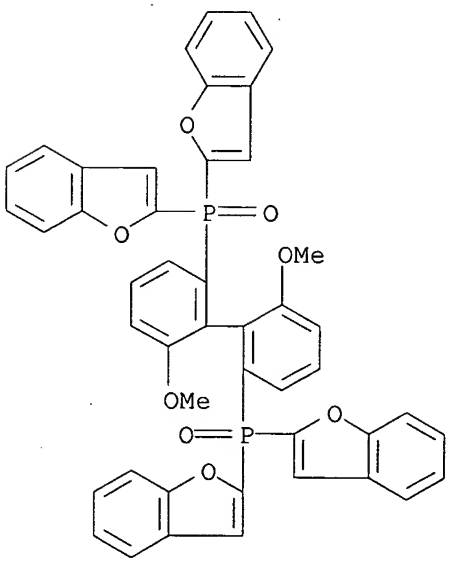
RN 145214-70-6 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis(benzo[b]thien-2-yl)-, (R)- (9CI) (CA INDEX NAME)



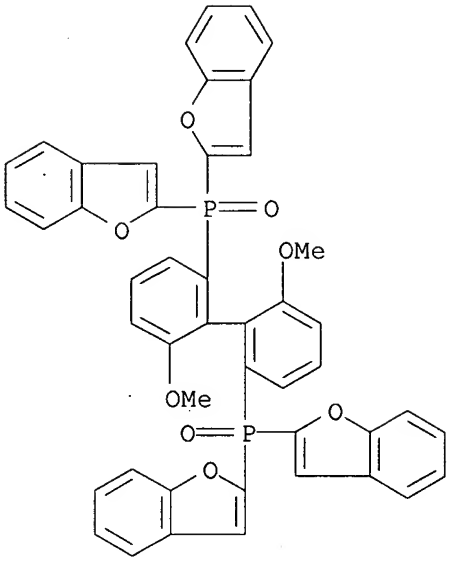
RN 145214-71-7 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis(benzo[b]thien-2-yl)-, (S)- (9CI) (CA INDEX NAME)



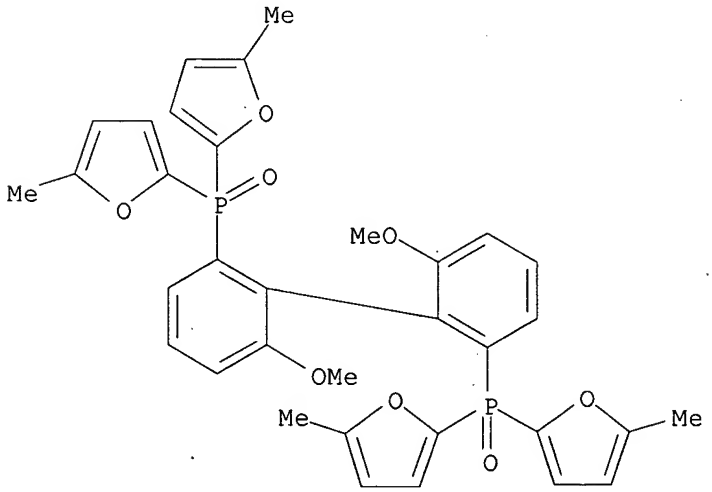
RN 145214-74-0 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis(2-benzofuranyl)-, (R)- (9CI) (CA INDEX NAME)



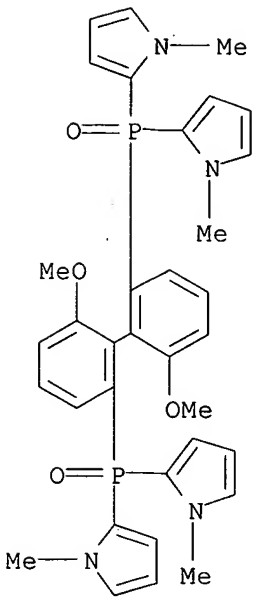
RN 145214-75-1 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis(2-benzofuranyl)-, (S)- (9CI) (CA INDEX NAME)



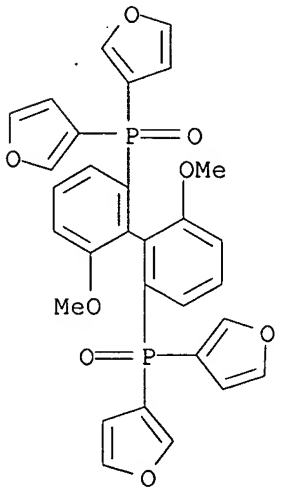
RN 145214-76-2 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis(5-methyl-2-furanyl)- (9CI) (CA INDEX NAME)



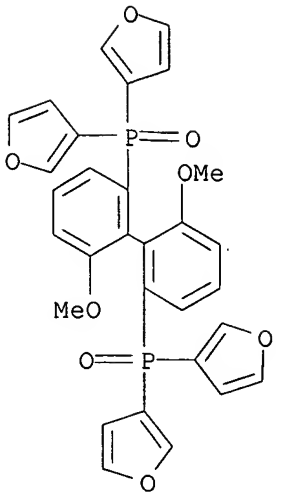
RN 145214-77-3 CAPLUS
CN 1H-Pyrrole, 2,2',2'',2'''-[(6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)diphosphinylidyne]tetrakis[1-methyl- (9CI) (CA INDEX NAME)



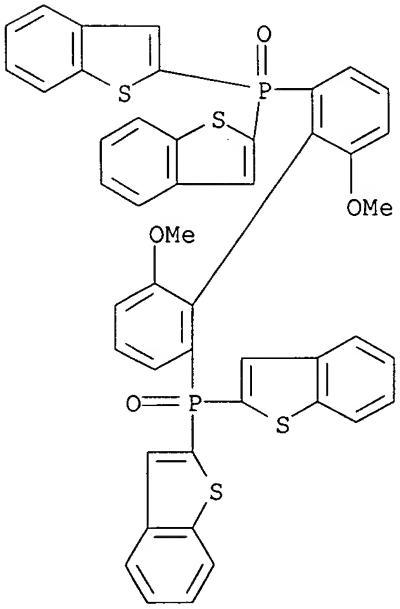
RN 145264-43-3 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[di-3-furanyl-, (R)- (9CI) (CA INDEX NAME)



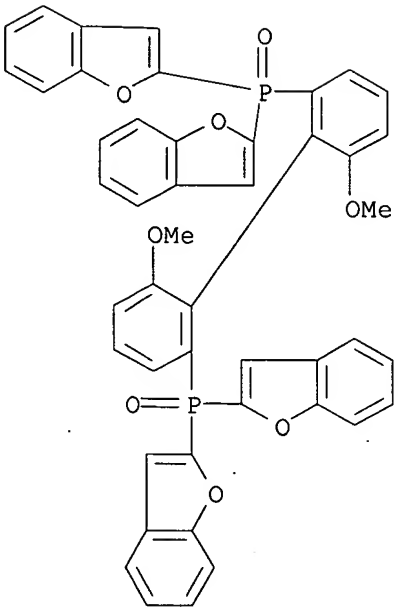
RN 145264-44-4 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[di-3-furanyl-, (S)- (9CI) (CA INDEX NAME)



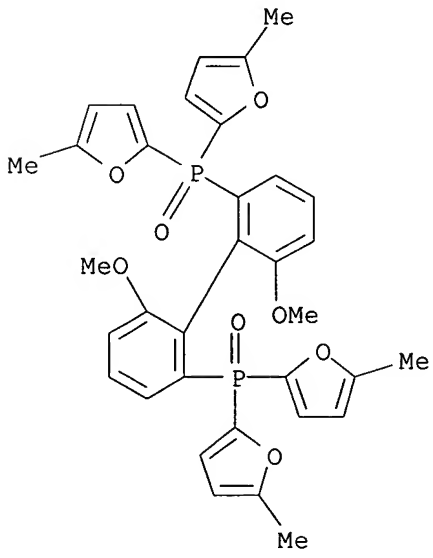
RN 145264-53-5 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis(benzo[b]thien-2-yl)- (9CI) (CA INDEX NAME)



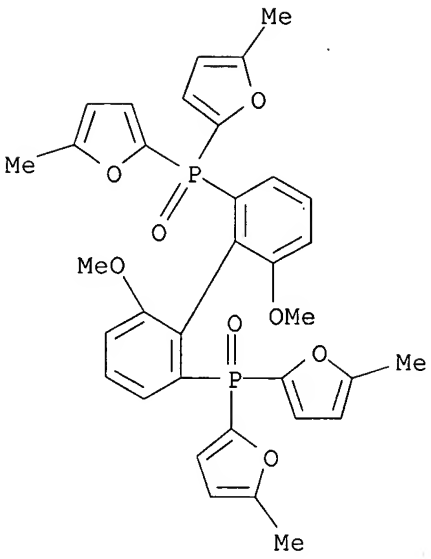
RN 145264-55-7 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis(2-benzofuranyl)- (9CI) (CA INDEX NAME)



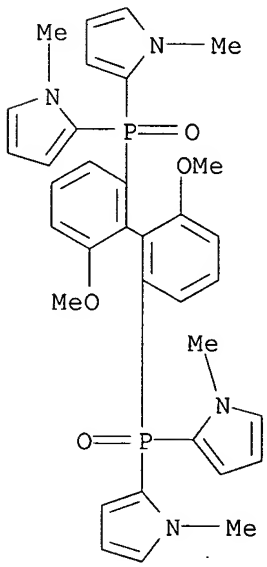
RN 145264-56-8 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis(5-methyl-2-furanyl)-, (R)- (9CI) (CA INDEX NAME)



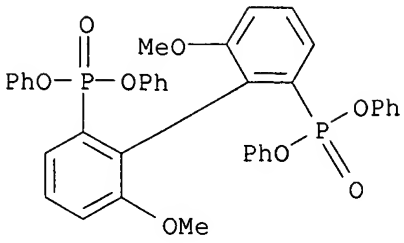
RN 145264-57-9 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis(5-methyl-2-furanyl)-, (S)- (9CI) (CA INDEX NAME)



RN 145264-58-0 CAPLUS
CN 1H-Pyrrole, 2,2',2'',2'''-[(6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)diphosphinylidyne]tetrakis[1-methyl-, (R)- (9CI) (CA INDEX NAME)



IT 145209-12-7P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation and resolution of)
RN 145209-12-7 CAPLUS
CN Phosphonic acid, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis-, tetraphenyl ester (9CI) (CA INDEX NAME)

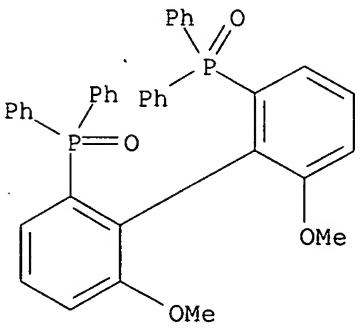


L3 ANSWER 30 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 1991:429462 CAPLUS
DOCUMENT NUMBER: 115:29462
TITLE: Axially dissymmetric diphosphines in the biphenyl series: synthesis of (6,6'-dimethoxybiphenyl-2,2'-diyl)bis(diphenylphosphine) ('MeO-BIPHEP') and analogs via an ortho-lithiation/iodination Ullmann-reaction approach
AUTHOR(S): Schmid, Rudolf; Foricher, Joseph; Cereghetti, Marco; Schoenholzer, Peter
CORPORATE SOURCE: Zent. Forschungseinheiten, F. Hoffmann-La Roche A.-G., Basel, CH-4002, Switz.
SOURCE: Helvetica Chimica Acta (1991), 74(2), 370-89
CODEN: HCACAV; ISSN: 0018-019X
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 115:29462

AB The new axially dissym. diphosphines (R)- and (S)-(6,6'-dimethoxybiphenyl-2,2'-diyl)bis(diphenylphosphine) [(R)- and (S)-I] and their analogs have been synthesized in enantiomerically pure form by a synthetic scheme which employs, as key steps, an ortho-lithiation/iodination reaction and a subsequent Ullmann reaction of the resulting iodides. The Ullmann reaction constitutes a new and efficient route to 2,2'-bis(phosphinoyl)-substituted biphenyl systems. Absolute configurations were established for (R)-I by x-ray anal. of the derived Pd complex. I proved to be as efficient as the previously described diphosphine (6,6'-dimethylbiphenyl-2,2'-diyl)bis(diphenylphosphine) in enantioselective isomerizations and hydrogenations.

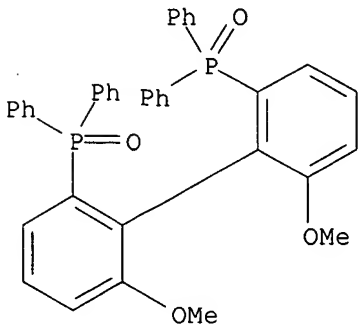
IT 133577-82-9P 133577-84-1P 133577-86-3P
133577-87-4P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and reduction of)

RN 133577-82-9 CAPLUS
CN Phosphine oxide, 1,1'-[(1R)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-diphenyl- (CA INDEX NAME)

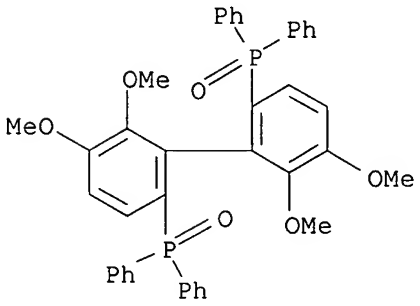


RN 133577-84-1 CAPLUS

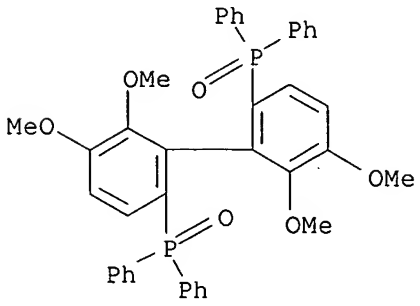
CN Phosphine oxide, 1,1'-[(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-diphenyl- (CA INDEX NAME)



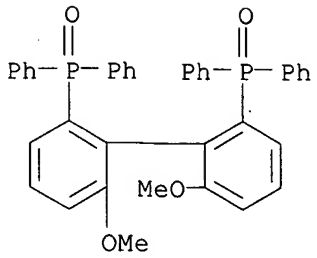
RN 133577-86-3 CAPLUS
CN Phosphine oxide, [(1S)-5,5',6,6'-tetramethoxy[1,1'-biphenyl]-2,2'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



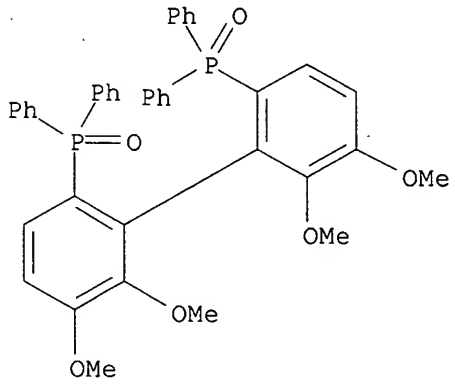
RN 133577-87-4 CAPLUS
CN Phosphine oxide, [(1R)-5,5',6,6'-tetramethoxy[1,1'-biphenyl]-2,2'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



IT 133545-15-0P 133545-18-3P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation and resolution of)
RN 133545-15-0 CAPLUS
CN Phosphine oxide, 1,1'-(6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[1,1-diphenyl- (CA INDEX NAME)



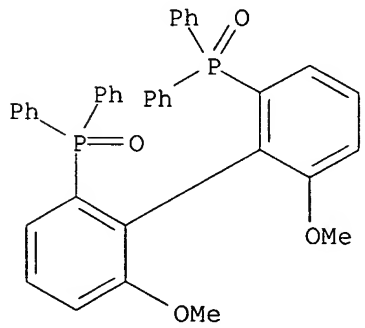
RN 133545-18-3 CAPLUS
CN Phosphine oxide, (5,5',6,6'-tetramethoxy[1,1'-biphenyl]-2,2'-diyl)bis[diphenyl- (9CI) (CA INDEX NAME)



IT 133577-83-0P 133577-85-2P 133644-94-7P
134435-30-6P 134435-31-7P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of)
RN 133577-83-0 CAPLUS
CN Butanedioic acid, 2,3-bis(benzoyloxy)-, [R-(R*,R*)]-, compd. with (R)-(6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[diphenylphosphine oxide] (1:1) (9CI) (CA INDEX NAME)

CM 1

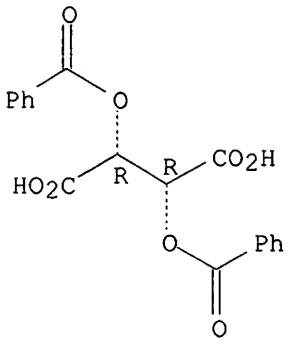
CRN 133577-82-9
CMF C38 H32 O4 P2



CM 2

CRN 2743-38-6
CMF C18 H14 O8

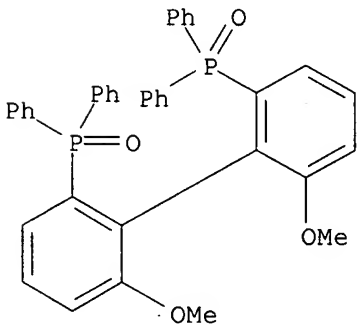
Absolute stereochemistry. Rotation (-).



RN 133577-85-2 CAPLUS
CN Butanedioic acid, 2,3-bis(benzoyloxy)-, [S-(R*,R*)]-, compd. with (S)-(6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[diphenylphosphine oxide] (1:1) (9CI) (CA INDEX NAME)

CM 1

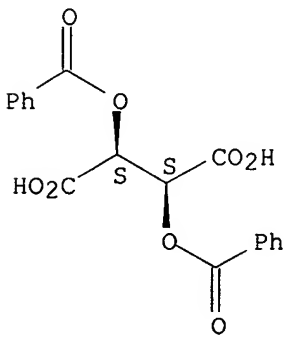
CRN 133577-84-1
CMF C38 H32 O4 P2



CM 2

CRN 17026-42-5
CMF C18 H14 O8

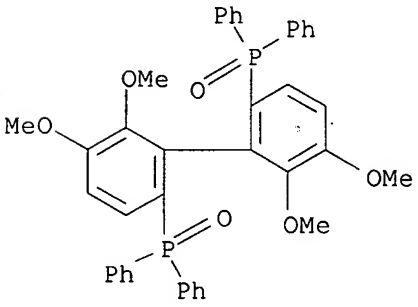
Absolute stereochemistry. Rotation (+).



RN 133644-94-7 CAPLUS
CN Butanedioic acid, 2,3-bis(benzoyloxy)-, [R-(R*,R*)]-, compd. with (S)-(5,5',6,6'-tetramethoxy[1,1'-biphenyl]-2,2'-diyl)bis[diphenylphosphine oxide] (1:1) (9CI) (CA INDEX NAME)

CM 1

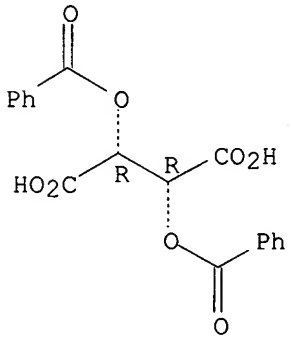
CRN 133577-86-3
CMF C40 H36 O6 P2



CM 2

CRN 2743-38-6
CMF C18 H14 O8

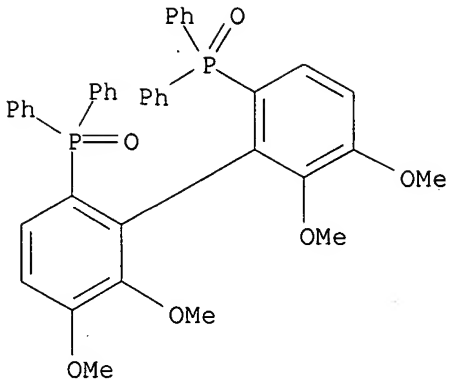
Absolute stereochemistry. Rotation (-).



RN 134435-30-6 CAPLUS
CN Butanedioic acid, 2,3-bis(benzoyloxy)-, [R-(R*,R*)]-, compd. with (5,5',6,6'-tetramethoxy[1,1'-biphenyl]-2,2'-diyl)bis[diphenylphosphine oxide] (1:1) (9CI) (CA INDEX NAME)

CM 1

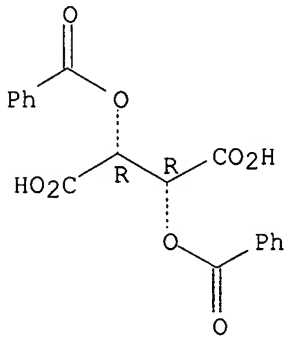
CRN 133545-18-3
CMF C40 H36 O6 P2



CM 2

CRN 2743-38-6
CMF C18 H14 O8

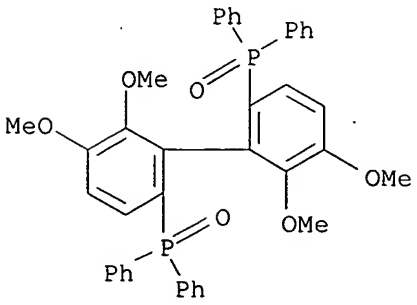
Absolute stereochemistry. Rotation (-).



RN 134435-31-7 CAPLUS
CN Butanedioic acid, 2,3-bis(benzoyloxy)-, [S-(R*,R*)]-, compd. with (R)-(5,5',6,6'-tetramethoxy[1,1'-biphenyl]-2,2'-diyl)bis[diphenylphosphine oxide] (1:1) (9CI) (CA INDEX NAME)

CM 1

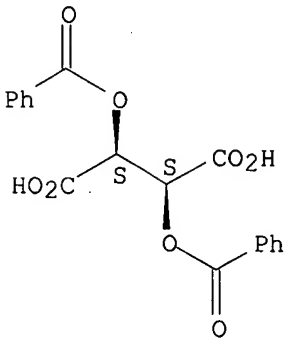
CRN 133577-87-4
CMF C40 H36 O6 P2



CM 2

CRN 17026-42-5
CMF C18 H14 O8

Absolute stereochemistry. Rotation (+).



L3 ANSWER 31 OF 31 CAPLUS COPYRIGHT 2008 ACS on STN
ACCESSION NUMBER: 1991:247526 CAPLUS
DOCUMENT NUMBER: 114:247526
TITLE: Preparation of chiral biphenyldiylbis(diphenylphosphine) derivatives and catalysts containing them
INVENTOR(S): Cereghetti, Marco Dr; Foricher, Joseph; Heiser, Bernd Dr; Schmid, Rudolf Dr
PATENT ASSIGNEE(S): Hoffmann-La Roche, F., und Co. A.-G., Switz.
SOURCE: Eur. Pat. Appl., 16 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

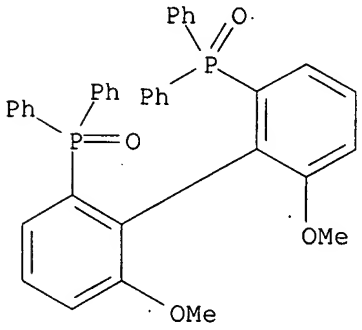
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 398132	A2	19901122	EP 1990-108686	19900509
EP 398132	A3	19910724		
EP 398132	B1	19950920		
R: AT, BE, CH, DE, DK, FR, GB, IT, LI, NL				
AT 128140	T	19951015	AT 1990-108686	19900509
JP 03005492	A	19910111	JP 1990-128108	19900517
JP 2940626	B2	19990825		
US 5488172	A	19960130	US 1994-294895	19940823
PRIORITY APPLN. INFO.:			CH 1989-1905 A	19890518
			CH 1990-880 A	19900316
			US 1990-521498 B1	19900510
			US 1992-884628 B1	19920515
			US 1993-152932 B1	19931115

OTHER SOURCE(S): MARPAT 114:247526
GI For diagram(s), see printed CA Issue.
AB The title compds. (I; R1 = alkyl; R2,R3 = H, alkoxy), were prepared for use as catalysts in enantioselective reactions (hydrogenations, rearrangements). Thus, (2-iodo-3-methoxyphenyl)diphenylphosphine oxide was dimerized using iodine-activated Cu in DMF to give 90.7% RS-(6,6'-dimethoxybiphenyl-2,2'-diyl)bis(diphenylphosphine oxide). The latter was resolved using D- or L-dibenzoyltartaric acid and the R-enantiomer in Bu3N/xylene/HSiCl3 at 0° was treated with aqueous NaOH to give 97.3% R-II. Geraniol was hydrogenated to S-citronellol in 98.9% e.e. using Ru(R-II)(CF3CO2)2 catalyst and 60 bar H in MeOH at 20°.
IT 133577-83-0P 133577-85-2P 133644-94-7P
133644-95-8P 133644-96-9P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT

(Reactant or reagent)
(preparation and decomposition of)
RN 133577-83-0 CAPLUS
CN Butanedioic acid, 2,3-bis(benzoyloxy)-, [R-(R*,R*)]-, compd. with (R)-(6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[diphenylphosphine oxide] (1:1) (9CI) (CA INDEX NAME)

CM 1

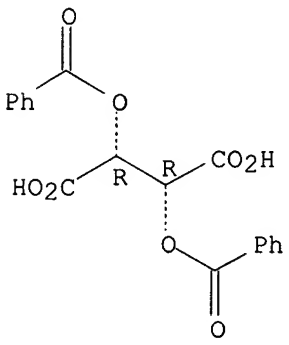
CRN 133577-82-9
CMF C38 H32 O4 P2



CM 2

CRN 2743-38-6
CMF C18 H14 O8

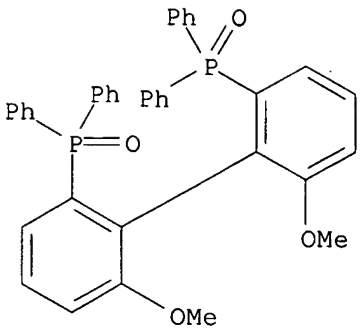
Absolute stereochemistry. Rotation (-).



RN 133577-85-2 CAPLUS
CN Butanedioic acid, 2,3-bis(benzoyloxy)-, [S-(R*,R*)]-, compd. with (S)-(6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[diphenylphosphine oxide] (1:1) (9CI) (CA INDEX NAME)

CM 1

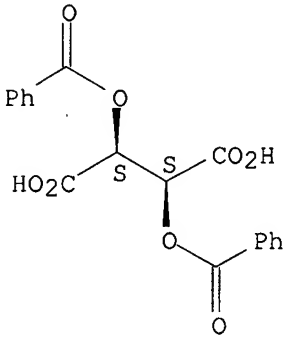
CRN 133577-84-1
CMF C38 H32 O4 P2



CM 2

CRN 17026-42-5
CMF C18 H14 O8

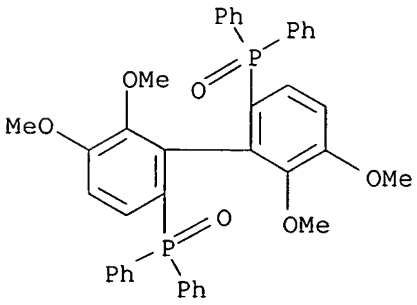
Absolute stereochemistry. Rotation (+).



RN 133644-94-7 CAPLUS
CN Butanedioic acid, 2,3-bis(benzoyloxy)-, [R-(R*,R*)]-, compd. with (S)-(5,5',6,6'-tetramethoxy[1,1'-biphenyl]-2,2'-diyl)bis[diphenylphosphine oxide] (1:1) (9CI) (CA INDEX NAME)

CM 1

CRN 133577-86-3
CMF C40 H36 O6 P2

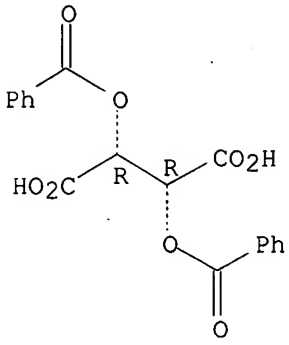


CM 2

CRN 2743-38-6

CMF C18 H14 O8

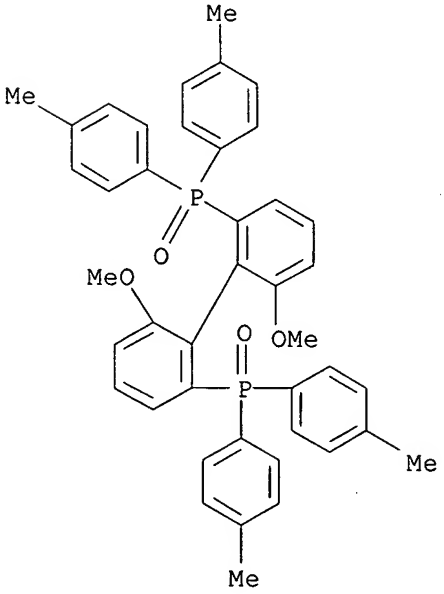
Absolute stereochemistry. Rotation (-).



RN 133644-95-8 CAPLUS
CN Butanedioic acid, 2,3-bis[(4-methylbenzoyl)oxy]-, [R-(R*,R*)]-, compd. with (R)-(6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis(4-methylphenyl)phosphine oxide] (1:1) (9CI) (CA INDEX NAME)

CM 1

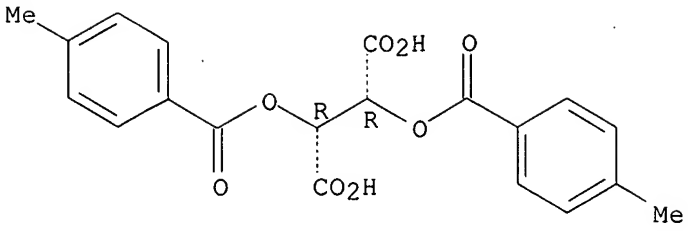
CRN 133577-88-5
CMF C42 H40 O4 P2



CM 2

CRN 32634-66-5
CMF C20 H18 O8

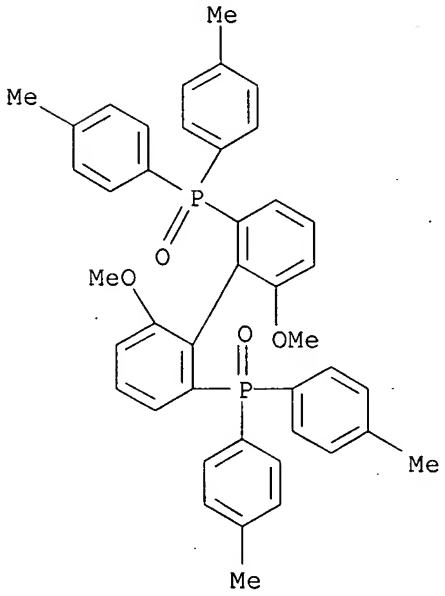
Absolute stereochemistry. Rotation (-).



RN 133644-96-9 CAPLUS
CN Butanedioic acid, 2,3-bis[(4-methylbenzoyl)oxy]-, [R-(R*,R*)]-, compd. with (S)-(6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis(4-methylphenyl)phosphine oxide] (1:1) (9CI) (CA INDEX NAME)

CM 1

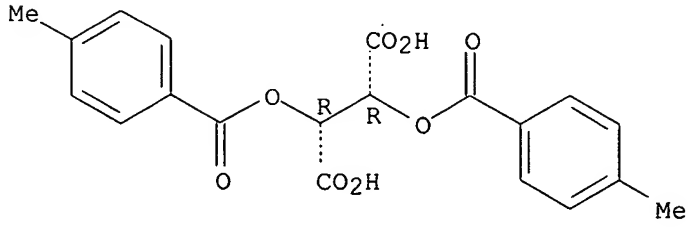
CRN 133577-89-6
CMF C42 H40 O4 P2



CM 2

CRN 32634-66-5
CMF C20 H18 O8

Absolute stereochemistry. Rotation (-).

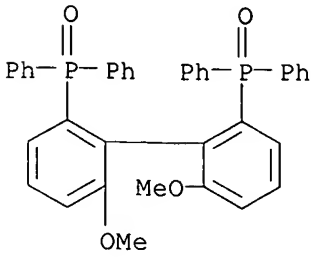


IT 133545-15-0P 133545-18-3P
RL: SPN (Synthetic preparation); PREP (Preparation)

(preparation and reduction and resolution of)

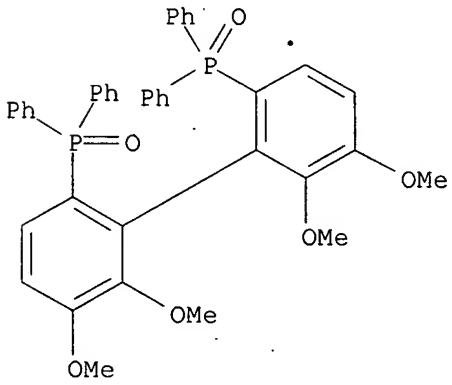
RN 133545-15-0 CAPLUS

CN Phosphine oxide, 1,1'-(6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[1,1-diphenyl- (CA INDEX NAME)



RN 133545-18-3 CAPLUS

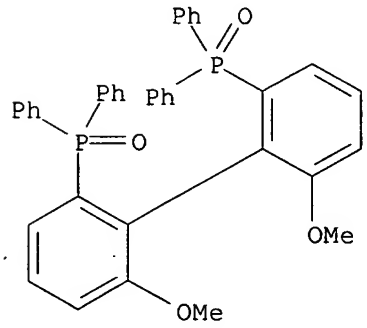
CN Phosphine oxide, (5,5',6,6'-tetramethoxy[1,1'-biphenyl]-2,2'-diyl)bis[diphenyl- (9CI) (CA INDEX NAME)



IT 133577-82-9P 133577-86-3P 133577-87-4P
133577-88-5P 133577-89-6P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and reduction of)

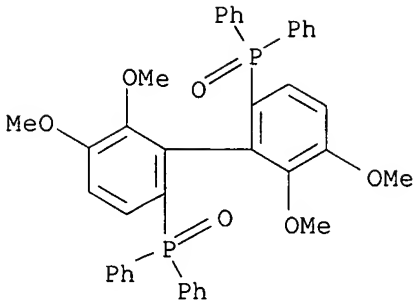
RN 133577-82-9 CAPLUS

CN Phosphine oxide, 1,1'-[(1R)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[1,1-diphenyl- (CA INDEX NAME)

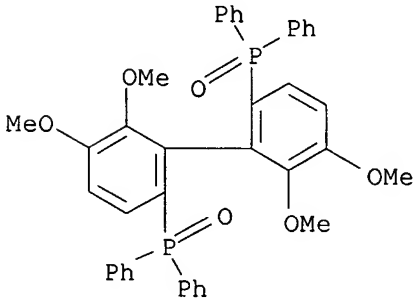


RN 133577-86-3 CAPLUS

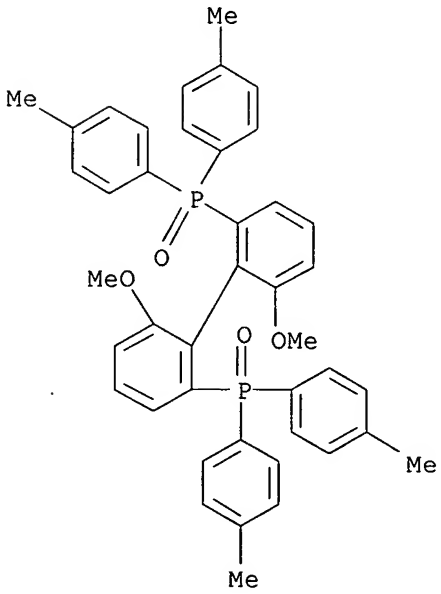
CN Phosphine oxide, [(1S)-5,5',6,6'-tetramethoxy[1,1'-biphenyl]-2,2'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



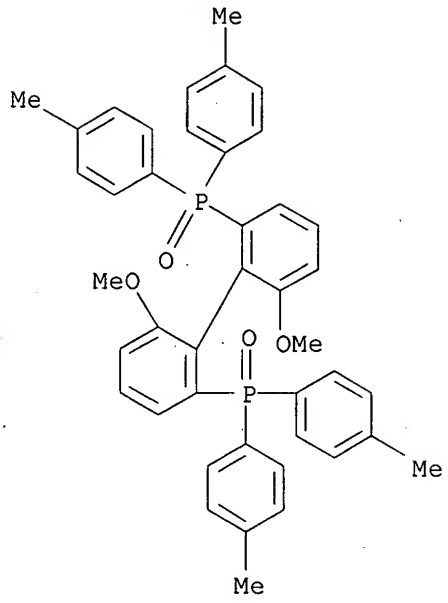
RN 133577-87-4 CAPLUS
CN Phosphine oxide, [(1R)-5,5',6,6'-tetramethoxy[1,1'-biphenyl]-2,2'-diyl]bis[diphenyl- (9CI) (CA INDEX NAME)



RN 133577-88-5 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis(4-methylphenyl)-, (R)- (9CI) (CA INDEX NAME)



RN 133577-89-6 CAPLUS
CN Phosphine oxide, [(1S)-6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl]bis[bis(4-methylphenyl)- (9CI) (CA INDEX NAME)



IT 133545-23-0P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation and resolution of)
RN 133545-23-0 CAPLUS
CN Phosphine oxide, (6,6'-dimethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis(4-methylphenyl)- (9CI) (CA INDEX NAME)

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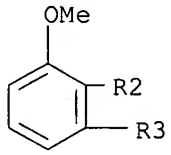

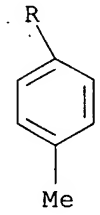

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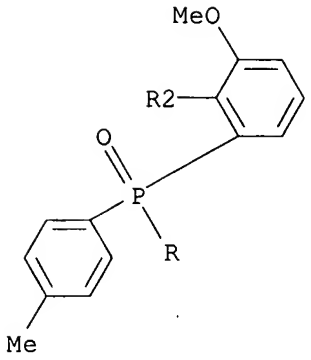

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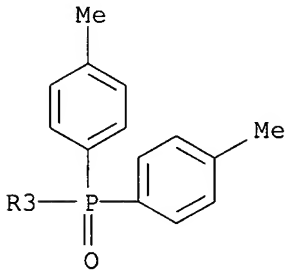

IT 133545-31-0
RL: RCT (Reactant); RACT (Reactant or reagent)
(reduction of)
RN 133545-31-0 CAPLUS
CN Phosphine oxide, (5,5',6,6'-tetramethoxy[1,1'-biphenyl]-2,2'-diyl)bis[bis(4-methylphenyl)- (9CI) (CA INDEX NAME)

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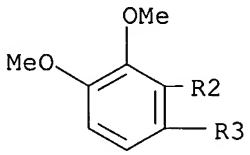

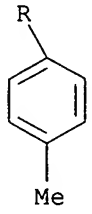

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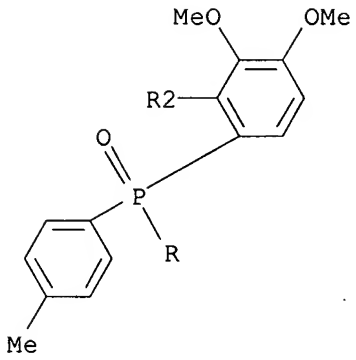

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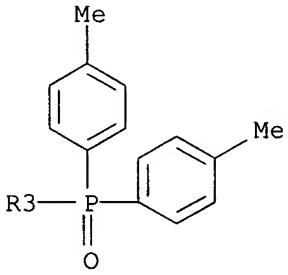

=>

---Logging off of STN---

=>
Executing the logoff script...

=> LOG Y

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	169.91	349.57

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)	SINCE FILE ENTRY	TOTAL SESSION
CA SUBSCRIBER PRICE	-24.80	-24.80

STN INTERNATIONAL LOGOFF AT 08:43:27 ON 02 APR 2008